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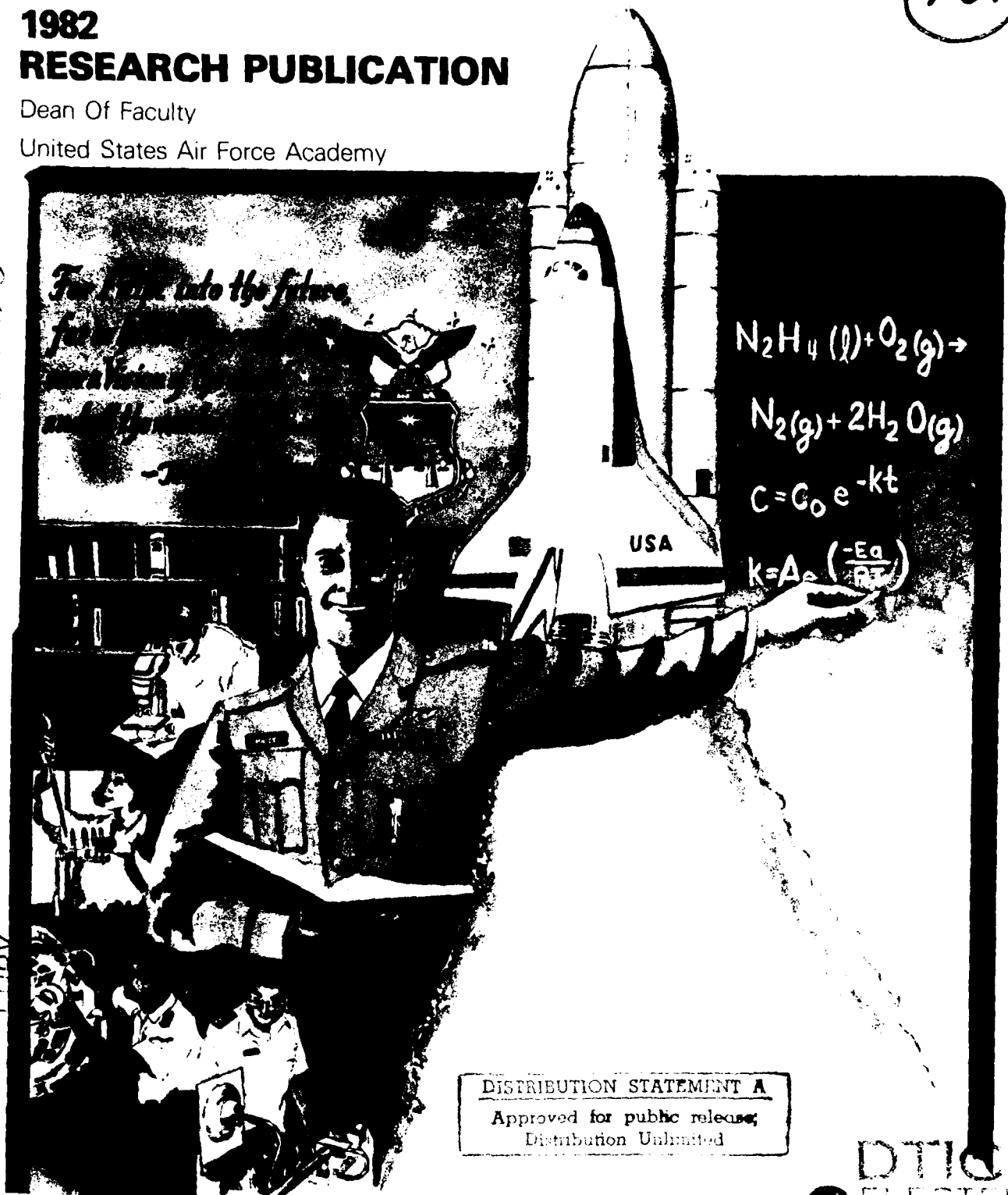
United States Air Force Academy



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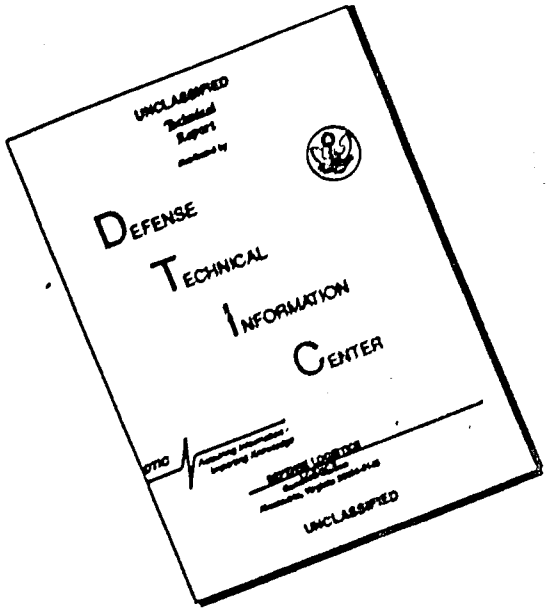

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DISCOVERY:

FACULTY PUBLICATIONS and PRESENTATIONS

FISCAL YEAR 1981

Books, Texts, Manuals, Chapters,
Papers, Reports, and Presentations

by

Members of the Faculty and Staff of the
United States Air Force Academy

Compiled by the Director of Research
Clayton V. Stewart, Lieutenant Colonel, USAF
October 1981

Edited by John A. Stibravy, Captain, USAF

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Dedication

This edition of *Discovery* is dedicated, with respect and love, to Colonel Merle D. Bacon, both for his development, establishment, and leadership of the Directorate of Research and Continuing Education, and for his more than professional efforts on behalf of the United States Air Force Academy. Thank you, good luck to you and remember that no matter how far you may travel, we will always be ready to welcome you home.

Colonel M. D. Bacon addresses the faculty upon the occasion of his retirement.

General William A. Orth presents Colonel Bacon's retirement certificate.

Once again I'm pleased to provide you with the Air Force Academy Faculty's Research for fiscal year 1981. We've made every effort to cross reference the various entries, and trust that the topical index will make this a readily accessible document. We've aimed at providing a readable report; hence, you'll find our tone somewhat informal. We invite your comments or inquiries to the Director of Research, Lt Col Clay Stewart. Thank you for your continued support.

William A. Orth

WILLIAM A. ORTH, Brig Gen, USAF
Dean of the Faculty

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CHAPTER A
Department of Aeronautics

1. BOLICK, William A., Captain and Instructor

a. "Seven-Hole Probe Data Acquisition System."
See A8a.

2. BUZZELL, William A., Captain and Instructor

a. Also with John Wright. "Pressure Measurement Using a High-Speed Data Acquisition and On-Line Calibration System." Supersonic Tunnel Association, Amsterdam, The Netherlands. 27 April 1981. (Presentation)

I presented a method for data acquisition in supersonic wind tunnels that is totally unique. Pressure measurement calibrations are continuously generated in real time using advanced computer hardware and software.

b. "Testing and Development of a Skin Friction Measuring Device for use in Turbomachines." (Research in progress)

I have completed the preliminary testing of triangular-shaped block gauges for measuring the skin friction coefficient in turbulent boundary layers as part of a program sponsored by the Air Force Aero-Propulsion Laboratory. Based upon initial results, modifications have been made to greatly improve the performance of these gauges for use in turbomachinery.

3. GRIFFIN, Kenneth E., Captain and Assistant Professor

a. "Active Control of Forward Swept Wings with Divergence and Flutter Aeroelastic Instabilities." AIAA/ASME/ASCE/AHS 22nd Annual *Structures Conference*, Atlanta, GA. 7 April 1981. (Presentation)

I demonstrated a solution for the aeroelastic divergence and flutter instabilities of forward swept wings. Active control of leading and trailing edge flaps gives a 23 percent increase in critical divergence and flutter speeds of two advanced composite forward swept wings.

b. "Measurements of the Wake Interactions of a Canard and a Forward Swept Wing." (Research in progress)

I made very accurate field pressure measurements in the wake of a canard proceeding a forward swept wing. Data from the interactions of these two lifting surfaces will provide correlations with numerical computer predictions. This research effort is sponsored by the Defense Advanced Research Projects Agency.

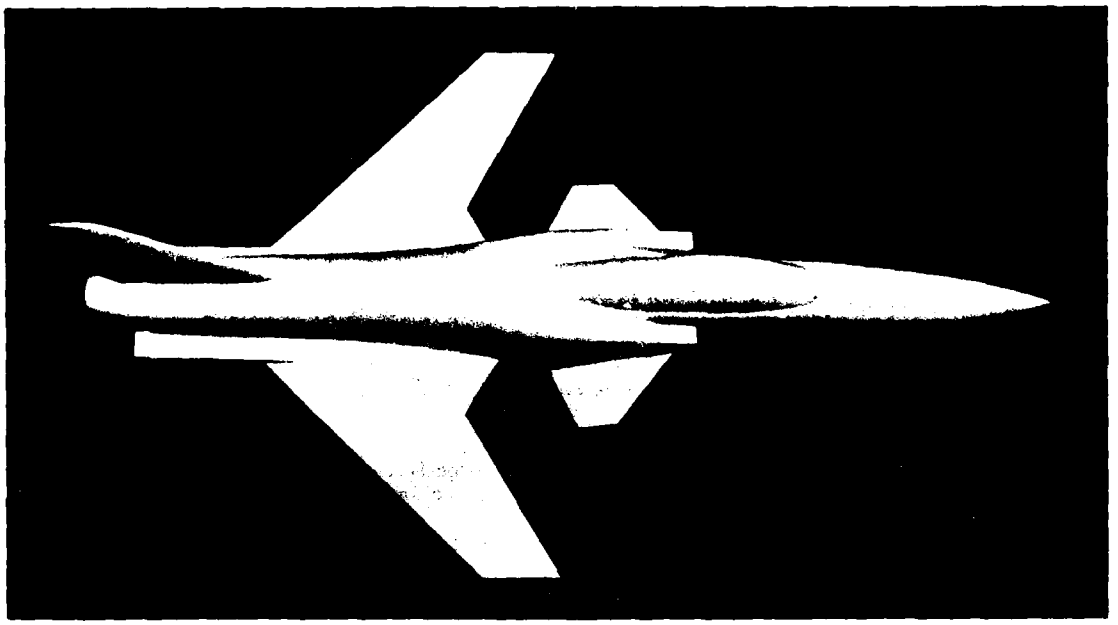
4. HIGGINS, A. Michael, Major and Associate Professor

a. Also with G. Kroth. "Development of Design Criteria for Rapid Pre-Ejection Crew Restraint of Upper Torso." *Aeronautics Digest*, Spring 1981, USAFA-TR-81-4, USAF Academy, CO, May 1981. (Article)

I investigated the possibility of reducing the period of time between the initiation of an ejection sequence and the first motion of the ejection seat out of the aircraft. Results of experiments on human volunteers are presented. Dr. G. Kroth is a Visiting Scientist at the 6570th Aerospace Medical Research Laboratory.

b. "Ejection Catapult Dynamics in a high-G Environment." 26th Annual SAFE Symposium, San Diego, CA. 6-10 October 1982. (Future presentation)

I will compare experimental results obtained from numerous firings of actual catapults with analytical predictions. Results predicted for high-G firings were substantiated by the data.



Wind tunnel model of DARPA forward swept fighter.

5. JONAS, Frederick M., Captain and Assistant Professor

a. "Canard Wake and Wing Interaction Study." (Research)

I am investigating the wake structures produced by highly evolved lifting surfaces, including canards, chimes, and blended wingbody junctions. Seven-hole pressure probes were used to map the vorticity fields produced by these aerodynamic devices. This work is sponsored by the NASA Ames Research Center.

b. "Seven-Hole Probe Data Acquisition System."
See A8a.

6. MATSUYAMA, Garey T., Lieutenant Colonel and Tenure Associate Professor

a. "An Assessment of Advanced Technologies for Application to General Aviation Aircraft." 1981 Business Aircraft Meeting and Exposition, SAE, Wichita, KS. 7-10 April 1981. (Presentation)

New Technologies, including new airfoils and composite structures, are suggested for use in the next generation of general aviation aircraft.

b. "Computer Aided Undergraduate Optimal Aircraft Design." 89th Annual Conference, ASEE, Los Angeles, CA. 21-24 June 1981. (Presentation)

I discussed the integration of digital computers into this field of undergraduate education, as well as advanced optimization techniques.

7. RETELLE, John P., Jr., Major and Associate Professor

a. Also with Donald A. Kennedy, and James McMichael. "Harmonic Optimization of a Periodic Flow Wind Tunnel." *AIAA Journal of Aircraft*, Vol. 18, No. 8, August 1981. (Article)

This paper describes the design and operation of a modification to a subsonic wind tunnel to produce periodic disturbances to the mean velocity. Bypass vanes in the unsteady flow generator permit the flow to be tuned to eliminate higher harmonic content in the Fourier series representation of the velocity.

b. Also with M. S. Francis and T. E. Keesee. "A Two-Degree of Freedom Oscillator for Unsteady Aerodynamics Application." FJSRL-TR-81-0007, Frank J. Seiler Research Laboratory, July 1981. (Report)

The oscillator mechanism described in this report was designed and built to produce an unlimited variety of unsteady motion possibilities of an airfoil mounted in a wind tunnel, both in pitch and translation. Also described are the computer interface and software considerations. System performance data are presented.

c. "Unsteady Flow Research at the Air Force Academy." Subsonic Aerodynamic Testing Association, Seattle, WA. 8-10 April 1981. (Presentation)

Current research underway for the experimental work on unsteady aerodynamics including preliminary data concerning time-varying velocity fields.

d. Also with M. S. Francis and J. E. Keesee. "A Computer-Controlled Oscillation Mechanism for Unsteady Aerodynamics Experiments." 102nd Annual Meeting, ASME, Washington, D.C., 15-20 November 1981. (Presentation)

Results on the concept of computer-controlled experiments for wind tunnels and fluid mechanics. Our data acquisition system was described in detail, including the mechanism for producing unsteady motions of an airfoil model in two degrees-of-freedom.

e. "Unsteady Vortex Entrapment on an Airfoil." (Research)

I am investigating the transient lift augmentation produced during dynamic stall on airfoils. Unsteady velocity data are obtained using a laser doppler velocimeter and are used to calculate vorticity fields. This is a joint work unit cosponsored by DFAN and the Seiler Laboratory.

Oil flow pattern on rectangular cross-section missle.

8. SISSON, Glynn E., Captain and Assistant Professor

a. Also with T. Bolick and F. Jonas. "Seven-Hole Probe Data Acquisition System." (Future Publication)

We completed work on this unique laboratory system for the NASA Ames Research Laboratory. This probe is capable of producing very accurate velocity vector measurements at up to 80 degrees off-axis and at compressible speeds up to Mach 1.4. Calibration algorithms and computer interface hardware and software are also described.

9. WILLIAMS, J. R., Captain and Instructor

a. "MNDO Calculations for Compounds Containing Aluminum and Boron."
See E6d.

10. WRIGHT, John A., Major and Assistant Professor

a. "Calibration of Pitot-Static Probes." (Research)

I have completed the calibration of several unique probes up to a Mach number of 1.4. Twelve standard pitot-static probes and two specially-designed probes were tested as part of this program sponsored by the Air Force Armament Laboratory. These data will form a data base for the design of future probes.

b. "Pressure Measurement Using a High-Speed Data Acquisition and On-Line Calibration System."
See A2a.

11. YECHOUT, Thomas R., Major and Assistant Professor

a. Also with D. C. Daniel, and G. Zollars. "Experimental Aerodynamic Effects of Three-Dimensional Square Cross-Section Missiles at moderate Angle of Attack." *Aeronautics Digest*, Fall, 1980, USAFA-TR-81-4, May 1981. (Article)

Subsonic aerodynamic force and moment characteristics were determined for a variety of missile shapes and nose geometries. The results clearly show the strong influence of body cross-section corner radius on these data.

b. Also with G. Zollars. "Aerodynamic Data Base for Rectangular Body Munitions." (Research)

Force and moment measurements have been combined with flow visualization of the leeside of the rectangular body munitions. Future work will map the velocity field behind the missiles to determine the flow effects produced by the various body geometries.

12. ZOLLARS, Gerald J., Captain and Assistant Professor

a. "Experimental Aerodynamic Effects of Three-Dimensional Square Cross-Section Missiles at moderate Angle of Attack." *Aeronautics Digest*, Fall, 1980, USAFA-TR-81-4, May 1981. (Article)
See A11a.

b. "Aerodynamic Data Base for Rectangular Body Munitions." (Research)
See A11b.

CHAPTER B
Department of Astronautics and Computer Science

1. BECK, Norman M., Captain and Assistant Professor

   a. "USAFA Project Scenic Fast." (Research in progress)

This continuing project involves flying a small self-contained payload (Materials processing, plant growth) aboard the Space Shuttle on a space-available bases. The payload is currently in the experiment design phase.

2. BODEN, Daryl G., Captain and Instructor

   a. "The USAFA Military Space Doctrine Symposium."
   See B7a.

   b. "Optimization of Multiple Intercept Trajectories."
   See B13a.

3. BOLZ, Richard E., Major and Assistant Professor

   a. "Development of Teaching Methodology for the Programming Language ADA." (Short Course)

ADA is the new Department of Defense high order programming language. This language was originally developed for use in embedded computer systems, but will likely have a profound impact on all new DoD software within five years.

The Department of Astronautics and Computer Science has developed a 4-day course which has become the recognized model course for teaching ADA DoD-wide. This course introduces ADA as the embodiment of most of the recent theoretical advances in software engineering.

4. ELLER, Thomas J., Lieutenant Colonel and Department Head

   a. "Magnetic Torques on Global Positioning System Satellites."AAS/AIAA Astrodynamics Specialist Conference, Lake Tahoe, NV. 3-5 August 1981. (Presentation)

Using a digital computer simulation of the earth-satellite motion, an estimate of the momentum storage capability of the satellites of the NAVSTAR Global Positioning System (GPS) is made for torques due to the interaction of the spacecraft magnetic field with the earth's magnetic field. Magnetic torque availability depends strongly on earth/sun pointing requirements and thus is a function of attitude control constraints. Sensitivity to satellite orbit-sun-geometry and vehicle field orientation is determined for 1000 pole-cm spacecraft manetic field in the presence of the earth's field as represented by the Mead-Fairfield 1972 model.

   b. "The USAFA Military Space Doctrine Symposium."
   See B7b.

5. FARIS, Ronald J., Captain and Assistant Professor

   a. "Satellite Bunching." (Research)

There is considerable concern in NASA and the DoD about the increasing object population in orbital areas around geosynchronous altitude. As the object density increases, the probability of collision increases. It is in our national interest to insure that collisions will not take place between our spacecraft and objects in their vicinity. To do this, many agencies, in particular NORAD, NASA-JCS, and Aerospace-LA, have done extensive research on the probability of collision between objects at geosynchronous altitude. My research efforts have been focused on verifying the results of their analyses, in particular that of Dr. Vladimar A. Chobatov, Aerospace-LA. After a thorough review of his analysis and supporting documentation, I

provided comments and corrections to Dr. Chobotov which were incorporated into his report published 25 Feb 81 and entitled, "Collision Hazard in Space." The probabilities of collision between objects in or near geosynchronous orbits as published in his report are:

Summary of Present and Projected Collision Probabilities for a 1000-Day Mission

	1980	1985	1995
Probability of Collision with Trackable Objects	(4174 objects)	(10000 objects) (multiplying factor)	(30000 objects)
Ten meter radius spacecraft in GEO	10^{-6} to 10^{-5}	2.5	7.3
Fifty meter radius spacecraft in GEO	4×10^{-5} to 4×10^{-4}	2.5	7.3

Note that the objects of concern are referred to as "trackable." Unfortunately we can't track all the objects at geosynchronous altitude. Our tracking capabilities allow detection of objects no smaller than one m^2 in size. Experts speculate that there is an order of magnitude greater amount of particles between one m^2 and one cm^2 in size at geosynchronous altitude. Therefore, the probabilities of collision are even greater than those listed in the table. At the present time, the collision probabilities at geosynchronous altitude have done nothing more than cause alarm. The Air Force and NASA are in the process of developing a system which will identify future time periods when spacecraft of interest are predicted to be "close" enough to know objects to warrant concern for collision or even to necessitate avoidance maneuvers. Obviously in the case of avoidance maneuver, the probability of collision will have to be greater than the probability of a catastropic maneuver motor thruster failure on board the spacecraft, that probability being between 10^{-5} and 10^{-4}. In other words, unless the probability of collision is greater than 10^{-4}, you stand a greater chance of incapacitating your satellite through thruster failures than you do in leaving it alone and hoping it doesn't hit something.

Steps presently being recommended to lower the future probability of collision at geosynchronous altitude include reducing the number of debris objects produced during orbit injection, reducing the possibility of booster explosion, even removing inactive satellites from geosynchronous orbits. The Air Force is not convinced that the risk to active satellites from inactive ones outweighs the decoy value of leaving inactive satellites in orbit forcing our adversaries to worry about whether they're really dead or just inactive on-orbit spares.

As one can see, the subject is anything but closed. The process for identifying future periods of high probability of collision is yet to be determined. Even more basic a question is who determines what a "high probability is, what criteria should be used? Should we remove dead satellites from orbit or leave them there to confuse the enemy? Answers to these questions and many more will become more difficult to determine and more important to our national security as geosynchronous populations continue to grow.

6. FRASER, Robert S., Captain and Instructor

a. "Advanced Aircraft Navigation." (Research in progress)

This project will examine the use of redundant inertial sensors in spatially separated clusters to improve aircraft navigation performance and reliability.

7. FRIEDENSTEIN, Charles D., Major and Assistant Professor

a. "A Concept: The USAF Space Operations School." 1981 Military Space Doctrine Symposium, United States Air Force Academy, CO. 1-3 April 1981. (Presentation)

More and more USAF leaders are recognizing the need to spend more time in long range system planning and doctrine development. Most solutions center around various organizational changes.

There is an alternative to reorganization: an academic alternative which should accomplish two things: First, it would create a center where space doctrine could be argued and developed by representatives of all organizations concerned. Secondly, it should train officers in doctrine and the academic disciplines unique to space operations.

1981 Military Space Doctrine Symposium. Lt Gen Kenneth Tallman with Maj Gen John E. Kulpa, Deputy Commander for Space Operations, Los Angeles AFS

b. Also with Daryl G. Boden, Thomas J. Eller, Joseph E. Justin, and Peter A. Swan. "The USAFA Military Space Doctrine Symposium," USAF Academy, CO. 1-3 April 1981. (Symposium)

This symposium gathered 250 representatives of the DoD space program to discuss the past, present, and future doctrine of U.S. space operations, U.S. space organization, and USSR and foreign space operations and organization. Four volumes of papers and a final report were published.

8. FROSTMAN, David L., Captain and Instructor

a. Also with Stanley J. Larimer, David K. McMaster. "Space-Based Laser Fire Control." (Research in progress)

There is currently a great deal of interest at Congressional and DoD levels concerning the feasibility of developing space-based laser weapons systems. AFWAL-AART (Avionics Laboratory) is currently investigating the technology available to support development of fire control systems for space-based laser applications.

The department of Astronautics and Computer Science has formed a research team to serve as consultants to the Avionics Laboratory on space-based laser fire control and to begin a long term project to develop a space-based laser weapon system simulation capability with emphasis on the fire control system requirements.

9. HARNLY, Douglas A., Captain and Instructor

a. Also with William E. Stone. "The Role of Inter-Orbit Phasing in GPS Coverage." AAA/AIAA Astrodynamics Conference, Crystal Bay, NV. 3 August 1981. (Presentation)

Members of DFACS have developed computer programs to analyze GPS Constellation coverage and Constellation accuracy as expressed in GDOP (Geometric Dilation of Precision). These routines were used to investigate the performance of two baseline constellations as the inter-orbit phasing was varied in both of them. Results independently support the constellation analyses of Space Division.

b. "Magnetic Momentum Dumping on Global Positioning System Satellites." (Research in progress)

There are presently six Global Positioning System (GPS) satellites in orbit as part of the full-scale development test phase of the system. This system will eventually consist of 18 to 24 satellites in six different planes, and will provide users with three-dimensional positions accurate to within ten meters worldwide. These satellites use on-board reaction wheels to maintain precise satellite attitude by speeding up or slowing down to absorb unwanted momentum. Due to outside torques, however, these satellites gradually build up unwanted momentum, reaching wheel speed maximum limits about every two weeks. Members of DFACS developed computer programs which use the satellite's on-board electromagnets to decrease wheel counteracting torque. These programs produce magnetic switch times and power settings which the Satellite Facility at Sunnyvale AFS, California, sends to each satellite about every 10-15 days to reduce the unwanted reaction wheel momentum. Current research on these programs involves:

(1) Implementing an automatic method for selecting switch times.
(2) Improving the method for calculating the optimum magnet settings to use at each switch time.
(3) Adding a momentum growth factor to more accurately predict the satellite's state prior to and during the magnetic momentum dumping cycle.
(4) Transferring real-time operational control of the programs to Rockwell International Corp. (GPS prime contractor).

10. HOOVER, Alan D., Captain and Instructor

a. "Trainable Gun."
See B20a.

11. JANISZEWSKI, Alan M., Captain and Instructor

a. "Large Space Structures."
See B23c.

12. JUSTIN, Joseph E., Major and Assistant Professor

a. "Space and its Role in National Defense Policy," Military Space Doctrine Symposium, USAF Academy, CO. 1-3 April 1981. (Presentation)

Military missions in space offer unique capabilities which make them a very useful means of achieving some of our national objectives. However, the development of a national defense policy for space requires a clear understanding of the nature of space operations, organization and employment. This paper will examine these issues of space and defense policy from two perceptions—space as a medium that should be demilitarized and the other—space as an element of national power—spacepower. These issues will be discussed in the context of what we have learned from the last twenty plus years of the space age.

b. "Hail, Columbia!" *Air University Review.* (Forthcoming article)

The challenges and opportunities of the Space Transportation System are presented in the light of the first flight of Columbia. It is viewed as a new military frontier, presenting new defense policy issues which must be properly addressed in order to fully exploit the potential of space.

13. KRUCZYNSKI, Leonard R., Lieutenant Colonel and Tenure Associate Professor

a. Also with Daryl G. Boden. "Optimization of Multiple Intercept Trajectories." (Research in progress)

Future missions in space will require a vehicle to fly-by and perhaps rendezvous with more than one target vehicle. We have written a computer program that attempts to minimize the fuel required to perform such a mission. The program is a first step and does not consider any constraints. The results of the checkout of this program were presented at the 1981 American Astronautical Society/American Institute of Aeronautics and Astronautics Astrodynamics Specialists Conference in August 1981.

14. LARIMER, Stanley J., Captain and Instructor

a. "Nationally Standardized Control System Design Software." (Research in progress)

The IEEE Technical Group on Computer-Aided Design is studying the possibility of a nationally-standardized computer-aided design program for control system analysis and synthesis. As a member of this group, I am preparing a candidate program for this purpose called TOTAL II. It is a much-improved version of my previous program TOTAL which has already been distributed to over 50 organizations in industry, government, and education.

15. McMASTER, David K., Lieutenant Colonel and Tenure Associate Professor.

a. "Space-Based Laser Fire Control."
See B8a.

16. MINNICH, Thomas G., Captain and Instructor

a. Also with Leonard R. Kruczynski. "Space Shuttle Rendezvous Simulation." (Research in progress)

The objective of this project is to combine a graphics display and the orbital motion equations with a mockup of the shuttle aft flight deck. The simulation will be used for demonstrations of satellite proximity operations for Astro classes and during lab tours. Eventually, studies may be made of alternative maneuvering techniques, autopilots and displays.

1981 Military Space Doctrine Symposium keynote speaker: General Bernard Schriever (USAF Retired)

17. NIELD, George C., Captain and Instructor

a. "A Model-Following Technique for Insensitive Aircraft Control Systems.' AIAA Conference on Atmospheric Flight Mechanics, Albuquerque, NM. 19-21 August 1981. (Presentation)

I describe a new control system design technique which can significantly improve plant performance in the presence of parameter uncertainties. The method has the attractive feature that the parameter-insensitivity and disturbance-rejection characteristics of the system can be selected independently from the no-disturbance, nominal plant performance.

b. "Large Space Structures.'
See B23c.

18. RIGGS, Tom L., Jr., Captain and Instructor

a. "Advanced Guidance and Estimation for Tactical Missiles." (Research in progress)

This project involves the development and analysis of high performance guidance algorithms for use in future air-to-air missiles. The algorithms are derived using recently developed mathematical theories in optimal Control and Estimation. Once derived, the algorithms are analyzed via a detailed missile simulation to determine the maximum performance capability of each algorithm as well as the associated computational requirements for system integration. A key issue in this program is the need to develop accurate methods for estimating the amount of time remaining until intercept (time-to-go). The accuracy of the time-to-go estimate directly influences the performance of the guidance algorithm. To fulfill this need, I have developed a number of accurate time-to-go estimation techniques resulting in drastically increased missile performance capabilities.

b. "Estimating Time-to-go for Use in Advanced Guidance Laws." Third meeting of the Coordinating Group on Modern Control Theory, U.S. Army Missile Command, Huntsville, AL. 20-21 October 1981. (Presentation)

19. SCHADE, Carl C., Major and Assistant Professor

a. "NSIA-AIAA Space Systems and Technology Workshop, USAF Academy, CO. 4-6 May 1981. (Host)

This workshop gathered military and industry representatives to forecast technology requirements for new military space systems.

20. SHEPARD, Randall L., Captain and Assistant Professor

a. Also with Alan D. Hoover. "Trainable Gun." (Research in progress)

I'll study the costs and benefits of using a trainable gun on air-to-ground aircraft and investigate the effectiveness of using optimally shaped weapon-delivery profiles to increase aircraft survivability.

21. STONE, William E., Captain and Instructor

a. "The Role of Inter-Orbit Phasing in GPS coverage."
See B9a.

22. SWAN, Peter A., Major and Assistant Professor

a. "Military Space Doctrine—The Missing Catalyst." Ira C. Eaker Essay Competition, *Air University Review.* (Research paper)

The Germans introduced an untried method of warfare on the plains of Europe during 1939 with a decisive effect. Are Americans willing to be as forward-looking a nation today by preparing an untried method of warfare for the space arena? Military history shows us that we should be forward-looking when planning for the next year. In our own history we have prided ourselves in

being innovative in technology and tactics.

Today, we are on the horizon of the technological rush into space. Will the American military be able to transition from the current activities using the space medium to the mission of space superiority? I believe the missing catalyst for this metamorphasis is a credible Military Space Doctrine.

b. "The USAFA Military Space Doctrine Symposium."
See B7b.

23. WITT, William P., III, Captain and Instructor

a. Also with A. N. Palazotto. "Nonlinear Analysis of Laminated Composite Plates." International Symposium on Mechanical Behavior of Structured Media, Carlton University, Ottawa, Canada. 21 May 1981. (Paper)

Paper concerns the inclusion of normal shear in laminated composites.

b. "Nonlinear Finite Element Analysis of Laminates." ASME/ASCE/ACAE Structures Conference, Boulder, CO. 22 June 1981. (Presentation)

I presented a new finite element method which can be used to do quasi 3 dimensional nonlinear analysis of composite laminater.

c. Also with Alan M. Janiszewski and George C. Nield. "Large Space Structures." (Research in progress)

We are investigating using nodal instead of modal structural dynamic models in the control of large space structures. We are also studying what simple test apparatus can be built at USAFA.

24. ZINGG, John A., Lieutenant Colonel and Tenure Professor

a. "Over-the-Horizon (OTH) Radar." (Research in progress)

The OTH experimental radar project has been developed to investigate the feasibility of using this methodology to provide early warning and tactical control in the 1200 to 1800 mile range. During the last year, system acceptance and initial operational tests were highly successful and demonstrated the operational potential of the radar.

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CHAPTER C
Department of Behavioral Sciences and Leadership

1. ARNOTT, Gail I., Captain and Assistant Professor

a. "The Effect of Individual Difference Moderators on Perceived Job Characteristics and Outcomes in Selected United States Air Force Units." (Dissertation research)

I investigated the moderating effect of certain individual difference measures on the relationship between perceived job characteristics and job attitudes. The Hackman and Oldham job characteristics model was used as the theoretical basis for the study. I found that existence need strength and growth need strength have more impact on general job satisfaction and growth satisfaction than need for achievement and social need strength.

2. BERMUDEZ, John M., Major and Assistant Professor

a. "An alternative to the Traditional Learning Center: The Air Force Academy How-to-Study Program." *See* C19a.

b. "Effects of Criteria on Flight Simulation: Study II — Multiple Criteria." *See* C19b.

c. "If You Can't 'Afford' a Traditional Learning Center, What is an Alternative?" *See* C19c.

d. "Impact of Varying Flight Training Criteria on Flight Task Transfer Performance." *See* C19d.

3. BOYLESS, James A., Captain and Instructor

a. "F100 Engine Diagnostic System: Status to Date." *NASA Conference Publication 2190*, National Aeronautics and Space Administration, Lewis Research Center, OH. May 1981. (Presentation and Paper)

This includes the status to date of the F100 Engine Diagnostic System and remaining activities during the 1980-1981 Flight Evaluation period. The information included a background, test methodology, and present analysis of findings. Diagnostic systems have been available for many aircraft but actual test use by flight line and maintenance personnel has been minimal. This paper presents preliminary findings that aircraft equipped with diagnostic systems can reduce maintenance manhours thus increasing aircraft availability. Automatic recording of engine life usage and documenting actual inflight engine performance for system improvement can be accomplished.

b. "F100 Engine Diagnostic System (EDS)—Summary of Results." *AIAA/ASME 17th Joint Propulsion Conference*, Colorado Springs, CO. July 1981. (Presentation and paper)

I summarize the results of the Flight Evaluation mentioned above. I conclude that beneficial results of a diagnostic system can be useful for flight line and maintenance personnel in maintaining the F100 engine for the F-15 aircraft. It also pointed out that four of the five general design goals were met during the evaluation. Inflight capture of engine performance showed that Stalls, Rear Compressor Variable Vane, Fan Turbine Inlet Temperature, and Vibration anomalies exist and further engineering analysis is required to determine actual cause and effect.

4. BUCHTA, William G., Captain and Instructor

a. "Impact of Varying Flight Training Criteria on Flight Task Transfer Performance." *See* C19d.

5. COLABUFO, J., Lieutenant and Research Assistant

a. "Impact of Varying Flight Training Criteria on Flight Task Transfer Performance." *See* C19d.

6. DANSBY, Mickey R., Captain and Associate Professor

a. "Academy Task Force Studies Cadet Attrition." *Academic Call to Quarters*, Volume II, Number 3: Autumn 1980 (USAFARP 53-1), United States Air Force Academy, CO. (Article)

I explain the work of the Attrition Research Task Force and summarize a study I conducted on Basic Cadet Training (BCT) attrition. I examined BCT attrition from an historical viewpoint and also addressed attrition trends in the class of 1984.

b. "Cadet Feedback Questionnaire." (Research in progress)

This is a joint research project of the Cadet Counseling Center and the USAFA Attrition Research Task Force, of which I am a member. The questionnaire is being developed to monitor cadet attitudes related to retention at USAFA. The intent is to develop an instrument which can be used on a longitudinal basis as an index of morale and to establish a baseline data-base against which to assess the impact of changes in the Academy environment. The questionnaire is undergoing development and has been administered three times thus far to random samples of the Cadet Wing.

Psychobiology Laboratory: Overcoming behavioral deficits due to Ionizing Radiation

7. FREESE, Ruth E., Captain, Instructor

a. "Archeological Excavations in Houses B and C and Their Adjacent Garden Areas, Fort Michilimackinac, Michigan." Student/Faculty Colloquiem, University of South Florida, FL. March 1981. (Presentation)

I summarized the excavations completed during the 1980 field season at Fort Michilimackinac and presented tentative results from the associated artifact analysis.

b. "Artifact Analysis." (Research)

I conducted research for the Mackinac Island Park Commission during the period October 1980 - May 1981. The artifact analysis provided contextual support for hypothesized cultural content in the excavation area of a French and British fort.

c. "Archeological Excavations in Houses B and C and Their Adjacent Garden Areas, Fort Michilimackinac, Michigan." University of South Florida FL., July 1981. (Thesis)

The thesis was a completion of an analysis of the excavation and artifactual support for acceptance of the *cultural content* hypotheses.

8. GINNETT, Robert C., Captain and Instructor

a. "A Case For The Expert Role in Process Consultation." The 41st Annual Meeting of the Academy of Management, San Diego, CA. August 1981. (Presentation)

This paper was based upon research conducted while serving as a consultant in a previous assignment. I investigate models of change strategies in organizations. Specifically, while the process consultation model for organizational change has considerable merit, there may be occasions when the consultants' job related expertise may save time and energy and provide more effective change strategies than the client is capable of developing. A successful consultation effort involving a mid-intervention change from a process to expert model is examined. Potential problems and benefits for future application as well as the need for future research are discussed.

b. "Teaching Organizational Behavior: Principles and Application at the Undergraduate Level." 89th Annual Convention of the American Psychological Association, Los Angeles, CA. August 1981. (Presentation)

As is the case at many colleges, organizational behavior (OB) is taught at the undergraduate level at the United States Air Force Academy. Somewhat atypical is that it is within the behavioral sciences department rather than as an adjunct of the management department. Nonetheless, the subject matter is presented both in required courses for all cadets and in advanced courses for upper classmen majoring in certain specialties.

The material is first presented at the sophomore level in a required course on behavioral science applications to leadership. Both organizational and small group dynamics are examined as sources of influence on the leader and the led. For those students who elect to major in either OB within behavioral sciences or human resources management, there are additional OB offerings in conjunction with industrial psychology and organizational development. All classes stress application of contemporary principles and behavioral theory to topical problems in both the military and civilian sectors. A course combining an introduction to management fundamentals and the basic OB principles is offered on an experimental basis. Faculty from both the management and the behavioral science departments are currently instructing, but the future of this approach is unclear. It should also be noted that courses in organization theory and personnel management have a great deal of interface with OB concepts.

Additionally, several applied programs have been developed for the cadet wing. One experiential approach was used with several intact cadet groups in an attempt to improve their overall effectiveness.

c. Also with William Rosenbach. "Job Redesign Consultation." Penrose Public Library, Colorado Springs, CO. May-July 1981. (Consultation)

Public Service Consultation with the Processing Division of Non Public Services for the Public Library. Workshops were held based upon diagnosed problems, particularly in the area of unenriched jobs. Recommendations for process approach procedures and implementing techniques were also made to senior staff supervisors.

d. "Power, Conflict and Stress." The Annual Conference of Air Force Dieticians at the School of Aerospace Medicine, Brooks AFB, TX. April 1981. (Presentation)

POWER—Presentation of the definition and nature of power in personal and organizational settings. French and Raven's conceptualization of the five bases of power was explained. Discussion of power dynamics in terms of who wants power, why power is sought, and how power is achieved. The effectiveness of power, compliance and the power corollary was discussed in terms of organizational effectiveness and personal satisfaction. McClelland's n Power as *Management Motivator* was introduced.

CONFLICT—Conflict was defined in both the traditional and the behavioral view. Discussion led to the conclusion that there is functional and dysfunctional conflict. The process nature of conflict was examined including five conflict resolution strategies and potential outcomes. Implications for organizational performance and satisfactions were discussed.

STRESS—Background of stress and the etiology of stress response in the human organism. Physiological and psychological reactions to normal stress as well as their benefits and problems were examined. Stress in modern organizational settings was analyzed along with Holmes and Rahe Life Change Scale.

Personal diagnosis of stress was accomplished by each participant. Symptoms of stress and danger signs as well as stress reduction techniques were presented.

e. "Overview of Productivity." Denver Federal Executive Board, Denver, CO. May 1981. (Presentation)

This presentation was made to the senior executives from all the Federal Agencies in the Denver region. Topics including the concerns with productivity, a brief history of issues, definition and measurement problems, areas for enhancement and potential problem areas were discussed.

f. "Personal Attitudes Towards Increasing Weapon Complexity."
See C10d.

9. GIRONE, M. H. Lieutenant and Research Assistant

a. "Radiation-Induced Hyperactivity in the C57BL/6J Mouse: Evidence for the Release of Endogenous Opiates."
See C17c.

10. GREGORY, Robert A., Major and Associate Professor

a. "Job Rede..gn." USAF Accounting and Finance Center, Lowry AFB, Denver, CO. September 1981. (Consultation)

The productivity point of contact at the Accounting and Finance Center initiated interaction between us and their Military Pay Directorate. They have requested that we give a diagnostic survey and gather data to examine the feasibility of work redesign for the Directorate. If it seems feasible, they plan to request that we do a job redesign project on some of their areas of concern.

b. "Leadership in the U.S. Air Force." Advanced Artillery School, Fort Sill, OK. April 1981. (Panel Presentation)

This presentation to the students dealt with current issues in leadership in the military services. Current problems of the services were shared and various approaches to dealing with them were considered. Research needs were identified as well as command leadership training issues.

c. Also with W. E. Rosenbach. "Officer Retention in the U.S. Air Force." American Phychological Association Convention, Los Angeles, CA. August 1981. (Presentation)

I presented the history and growing magnitude of three major problems in the unpredictable retention patterns of U.S. Air Force officers: Engineers, Pilots, and Navigators. Causes of the three problem areas were examined and hypothesized to differ dramatically from one to the other. Recruitment was a major problem with Engineers; retention was the major factor with Pilots; and lack of predictable career pattern/visability was a major problem with Navigators. Actions being taken by the Air Force to alleviate the problems were also examined.

d. Also with R. C. Ginnett. "Personnel Attitudes Toward Increasing Weapon Complexity." (Consultation)

The DoD Program Analysis and Evaluation Directorate requested that we do a research project on the impact of complexity on attitudes of military personnel working on and operating weapon systems. The project is in the early formative stages.

e. "Productivity/Motivation in the DoD." Headquarters USAF Directorate of Manpower, Pentagon, Washington, D.C. September 1981. (Consultation)

This effort has focused on the writing of a DoD Instruction on motivation. This instruction, of which we did a thorough re-write for HQ USAF to submit to DoD, will be supplemented by an AF directive regarding motivation. We will be involved in the writing of the AF directive.

f. "Responding to Hard Times." Academy of Management, San Diego, CA. August 1981. (Panel Chairman)

This panel dealt with how public sector institutions respond to "hard times" in terms of availability of resources (money, personnel, etc.). Of particular interest were papers on the all-volunteer force and changing nature of military manpower.

g. "Job Attitudes of Air Force Academy Military Psychology Division Members."
See C20a.

h. "Job Attitudes of Commerical and U.S. Air Force Pilots."
See C20b.

11. HUELF, N., GS-5 and Educational Assistant

a. "An Alternative to the Traditional Learning Center: The Air Force Academy How-to-Study Program."
See C19a.

b. "If You Can't 'Afford' A Traditional Learning Center, What is an *Alternative*?"
See C19c.

c. "Skills for Academic Improvement. A Guide for How-to-Study Counselors."
See C19e.

12. KASS, W. C., Lieutenant and Research Assistant

a. "Radiation-Induced Hyperactivity in the C57BL/6J Mouse: Evidence for the Release of Endogenous Opiates."
See C17c.

13. KOONCE, J. M., Lieutenant Colonel and Tenure Professor

a. "Sex as a *Moderator Variable* for the Selection and Training of Persons for a Skilled Task."
See C16a.

14. LAWRENCE, G. H., Lieutenant and Research Assistant

a. "Cholinergic Activation, Not Blocade, Reverses Radiogenic Deficits in Behavior."
See C17b.

b. "Reversal of Radiogenic Adipsia by Cholinergic Stimulation of the Hypothalamus."
See C17d.

15. MARSHAK, William P., Captain and Assistant Professor

a. "Spatial and Temporal Factors in the Perception of Direction." (Research in progress)

I conducted preliminary experiments using the computer graphics system of the Department of Astronomics and Computer Science. The preliminary results are encouraging, but not of sufficient quality to separately report. These efforts have clearly shown a need for a system with features unavailable at the Academy and procurement of such a system has commenced.

b. "Perceptual Integration and Differentiation of Directions in Moving Patterns." Diss. Northwestern University, Evanston, IL, June 1981. (Dissertation)

This was largely devoted to description of a theory of motion perception which serves as a basis for the current work

16. McCLOY, Thomas M., Major and Associate Professor

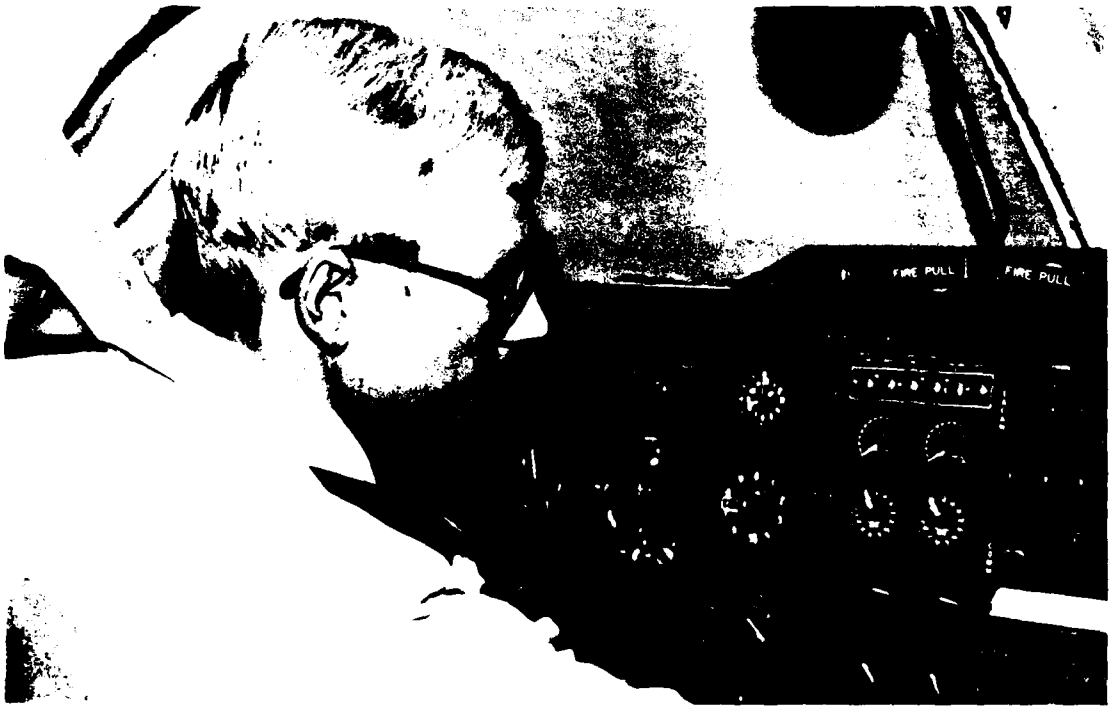
a. Also with J. M. Koonce. "Sex as a Moderator Variable for the Selection and Training of Persons for a Skilled Task." Proceedings: 1981 Symposium on Aviation Psychology, April 1981, The Ohio State University, Columbus, OH. (Article)

This paper, tells of a series of studies designed to investigate male and female differences in cognitive styles and psychomotor abilities and their relationship to the acquisition of flying skills. The results support the idea of sex as a moderator variable in the prediction of flying skills. Regression equations, tailored by sex, had significantly different predictor variables, suggesting that regression equations developed on one sex may not be optimum for selection of persons of the other sex.

b. "Gender Differences in the Transfer of Training of Flight Skills." (Research)

Our previous research has consistently found females take significantly longer than males to reach criterion performance on basic flight maneuvers. This study asked the question if males and females are brought to the same level of performance on one set of basic instrument maneuvers, will performance on a second set yield non-significant gender differences? The results indicated that although both males and females benefitted about the same from the prior training, the significant gender difference still persisted. Current work is investigating the capability of cognitive and motor training to diminish the differences.

c. "Impact of Varying Flight Training Criteria on Flight Transfer Performance."
See C19d.



Human Factors Research includes the use of a Twin-Engine Jet Flight Simulator

17. MICKLEY, G. Andrew, Captain and Associate Professor

a. "Antihistamine provides sex-specific radiation protection." *Aviation, Space and Environmental Medicine*, 52, 1981, 247-250. (Article)

In this article, I demonstrated that antihistamines were capable of reversing behavioral deficits produced by ionizing radiation. However, this was only true in the case of sexually-intact males. Females and gonadectomized rats of both sexes wee not benefited by these treatments. The work suggests some interaction between sexual hormones, histamine and radiation-induced incapacitation.

b. Also with G.L. Gibbs, G.H. Lawrence, K.E. Stevens and G.A. White. "Cholinergic Activation, Not Blocade, Reverses Radiogenic Deficits in Behavior." *Radiation Research.* (Article in review)

We demonstrated that drugs which activate the neurotransmitter acetylcholine are capable of countering some of the effects of ionizing radiation. However, those drugs which block the release of acetylcholine potentiate radiation's effects.

c. Also with G.L. Gibbs, K.E. Girone, W.C. Kass, K.E. Stevens and G.A. White. "Radiation-induced hyperactivity in the C57BL/6J Mouse: Evidence for the Release of Endogenous Opiates." *Neuroscience Abstracts*, 1981, in press. (Abstract)

We demonstrated that exposure to ionizing radiation produces the release of morphine-like substances in this strain of mouse. These endogenous opiates may be incapacitating in many species—including man. We then reversed the effects of ionizing radiation by using a drug (naloxone) which is used clinically to counter morphine overdoses.

d. Also with G.L. Gibbs, G.H. Lawrence, K.E. Stevens and G.A. White. "Reversal of Radiogenic Adipsia by Cholinergic Stimulation of the Hypothalamus." *Proceedings of The 19th Annual Meeting of the Radiation Research Society*, 1981, 132. (Abstract and Presentation)

In this publication, we showed how one could produce drinking in irradiated animals (who normally don't drink after exposure). This was accomplished by neurochemically activating cells in the brain of experimental animals. The study suggests that the brain systems which control thirst are altered by radiation exposure and that this alteration can be countered by activating the hypothalamus which employs acetylcholine as a neurotransmitter.

18. MITCHELL, Melinda A., Captain and Instructor

a. "Administration of the United States Air Force Child Advocacy Program." A Master's Degree Thesis, in partial completion of a Master's in Public Administration, University of Oklahoma, OK. December 1980. (Thesis)

This thesis deals with the historical background of the U.S. Air Force child advocacy program, including survey of the literature, then goes on to describe the present policy system. It pursues two policy alternatives, with evaluation and comparison of these alternatives. Conclusions and recommendations are offered.

19. NATAUPSKY, Mark, Major and Associate Professor.

a. Also with J. Bermudez, N. Huelf and V. Tirman. "An Alternative to the Traditional Learning Center: The Air Force Academy How-to-Study Program." American Education Research Association Convention. Los Angeles, CA. April 1981. (Presentation)

This was an elaboration of our program and the presentation listed in C19c.

b. Also with J. Bermudez, T.M. McCloy and V. Tirman. "Effects of Criteria on Flight Simulation: Study II—Multiple Criteria." Frank J. Seiler Research Laboratory Technical Report, FJSRL-TR-80-0020. USAF Academy, CO. December 1980.

This report described a study using the GAT-1 flight simulator in which the effects of various criteria on a training task were assessed relative to criteria on a transfer task. In addition to obtaining statistical significance, the variables were able to account

for approximately 29% of the variance. Earlier flight simulation transfer of training tasks ignored criteria effects and were able to account for approximately 3% of the variance.

c. Also with J. Bermudez, N. Huelf and V. Tirman. "If You Can't 'Afford' a Traditional Learning Center, What is an Alternative?" American College Personnel Association Convention, Cincinnati, OH. April 1981. (Presentation)

This described the USAF Academy's How-to-Study Program and indicated how this program could serve as a model for adaptation at civilian schools.

d. Also with J. Bermudez, W. Buchta, J. Colabufo, C. Seeber, and V. Tirman. "Impact of Varying Flight Training Criteria on Flight Task Transfer Performance." Human Factors Society meeting, Los Angeles, CA. October 1980. (Presentation)
See C19b.

e. Also with N. Huelf. "Skills for Academic Improvement: A Guide for How-to-Study Counselors." USAF Academy Technical Report, USAFA-TR-81-6, USAF Academy, CO. June 1981. (Report)

This report presents information about learning disabilities, counseling techniques, and the session plans which are used by How-to-study Counselors. There are 15 different session plans that cover topics such as time planning, self-reinforcement, motivation, problem solving, note taking, listening, test taking strategies, and others.

20. ROSENBACH, William E., Lieutenant Colonel and Associate Professor

a. Also with R.A. Gregory. "Job Attitudes of APA Military Psychology Division Members." (Paper)

This paper reports the results of a study done of all members of Division 19 (Military Psychology) of the American Psychological Association. The main foci were to examine: 1) the attitudes of subgroups for psychologists who were in this division based upon demographic factors (sex, education, employer, area of specialization, etc.) and 2) the attitudes of Division 19 members compared to a normative group of professional and technical employees.

b. Also with R.A. Gregory. "Job Attitudes of Commercial and U.S. Air Force Pilots." *Armed Forces and Society*. (Article, in press)

This article reports on research done comparing job attitudes of a cross-section of Air Force Pilots to the pilots of a major domestic commercial airlin . In particular, we were interested in job characteristics of the two jobs and attitudes toward context/environmental factors causing poor job attitudes. Implications are advances as to causes of dissatisfaction and attrition of Air Force pilots versus the very low turnover of airline pilots.

c. "Officer Retention in the USAF."
See C10c.

21. SEEBER, C., Lieutenant and Research Assistant

a. "Impact of Varying Flight Training Criteria on Flight Task Transfer Performance."
See C19d.

22. STEVENS, K.E., GS-9 and Laboratory Technician

a. "Cholinergic Activation, Not Blocade, Reverses Radiogenic Deficits in Behavior."
See C17b.

b. "Radiation—Induced Hyperactivity in the C57BL/6J Mouse: Evidence for the Release of Endogenous Opiates."
See C17c.

c. "Reversal of Radiogenic Adipsia by Cholinergic Stimulation of the Hypothalamus."
See C17d.

23. SWINEY, John F., Jr., Major and Assistant Professor

a. "Content Influences on Formal Reasoning." *Proceedings*: American Educational Research Association Meeting, Los Angeles, CA, 1981. (Presentation)

Research evidence was presented which focuses on how task content knowledge (e.g., general physics knowledge in a physics reasoning task) influences scientific reasoning and also how general scientific reasoning ability is related to fluid-crystallized models of general ability.

b. Also with M.G. Linn. "Individual Differences in Formal Thought: Role of Expectations and Aptitudes." *Journal of Education Psychology*, 1981. (Article)

I present an investivation of individual differences in scientific reasoning which focuses on expectation-based rules governing formal-reasoning performance and the relationship with aptitudes considered important in formal reasoning.

24. TIRMAN, V., Lieutenant Colonel and Associate Professor

a. "Effects of Criteria on Flight Simulation: Study II — Multiple Criteria."
See C19b.

b. "An Alternative to the Traditional Learning Center: The Air Force Academy How-to-Study Program."
See C19a.

c. "If You Can't 'Afford' a Traditional Learning Center, What is an Alternative?"
See C19c.

d. "Impact of Varying Flight Training Criteria on Flight Task Transfer Performance."
See C19d.

25. ULRICH, Thomas E., Captain and Instructor

a. "A Study of Scoring Procedures for the In-Basket Technique." (Dissertation research)

This was a research project conducted as part of my doctronal preliminary examination, focusing on a major component of the managerial assessment center approach to personnel selection. I developed a managerial In-Basket exercise which was used as a key portion of the examination given to candidates for promotion to Police Captain in a large midwestern city. The research portion of the project differed from previous investigations in that each in-basket was scored independently by four assessors (rather than one), and scoring reliability across four scoring methods was examined. Results suggested that typical dimension scoring was ineffective unless particularly thorough training was provided to the assessors; a behaviorally-oriented scoring system was indicated as the most reliable approach to such an assessment instrument. In addition, the study demonstrated that assessments made by individual assessors can be considered reasonably similar to ratings that other trained individuals would make.

26. WILLIAMS, John W., Jr., Colonel, Permanent Professor and Head

a. "An Investigation of Divorce Among Military Officers Using Middle Range Theory." International Symposium on Divorce and Remarriage, Leuvan, Belgium. September 1981. (Presentation)

I describe theoretical approaches to the study of divorce and family dissolution and points up several propositions validated through an examination of divorce among military officers. Validation of these propositions adds a "building block" in developing a theory of divorce.

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CHAPTER 2
Department of Biology

1. BIRKNER, John H., Lieutenant Colonel and Associate Professor

a. "Genetics Literature Review." (Research)

This project is an on-going effort in the Department of Biology. The project requires the collection and analysis of information on the worldwide progress of recombinant DNA research (genetic engineering). The emphasis during the past year has been the collection of information on technology transfer, the extent to which foreign countries are being supplied with U.S. know-how in genetic engineering. The Defense Intelligence Agency sponsors and funds this effort.

2. BUTLER, William D., Captain and Assistant Professor

a. "Depleted Uranium." (Research)

The A-10 aircraft has been especially designed for close air support. Part of its effectiveness is due to the depleted-uranium munitions used against enemy tanks. My research effort attempts to determine toxic effects (if any) of depleted-uranium from these munitions on mammalian systems. I used electron microscopy to assess possible changes in tissues of rats exposed to depleted uranium. The Air Force Armament Testing Laboratory (Air Force Systems Command), Eglin AFB sponsored and funded this project.

3. CAIRNEY, William J., Major and Associate Professor

a. "The Effect of Hyperbaric Oxygen on Certain Growth Features of Four Dermatophytes." FJSRL-TR-005. Frank J. Seiler Research Laboratory, USAF Academy,CO. Dec 1980. (Technical Report)

This publication deals with the effect of hyperbaric oxygen (oxygen under high pressure) on four mycotic agents responsible for ringworm diseases of the skin. I used organisms isolated from actual disease processess and determined the growth rates for these pathogens under various hyperbaric oxygen levels. All of the organisms showed inhibited growth at oxygen levels well tolerated by humans. This suggests that the compression chamber facilities currently operated by the Air Force might be effective in treating diseases caused by these organisms. The Department of Biology currently maintains an active research program in the field of hyperbaric oxygen therapy and mycotic disease agents.

b. Also with Karen O'Hair. "The Effect of Hyperbaric Oxygen on the Growth of *Rhizopus Nigricans*." FJSRL-TR-006. Frank J. Seiler Research Laboratory, USAF Academy, CO., December 1980. (Technical Report)

This publication represents a continuation of my hyperbaric oxygen research. *Rhizopus* species are often involved in fungal infections of the lung. Definite inhibition of both mating strains of the pathogen was observed within oxygen levels well tolerated by humans.

c. Also with Roger Page, Jr. and Donald Choisser. "Project PHEN-X; A Pilot Project in Physiological/Human Factors in Tactical Air Operations." Special Study Report. HQ Air Force Medical Service Center, Brooks AFB, TX., August 1980. (Actually published in November 1980). (Report)

Project PHEN-X is a program conceived by the Medical Service Center (AFMSC/SGPA, Brooks AFB) to study Psychophysiological, Human, and Environmental factors (X) as they relate to tactical air operations. The purpose of this project is to get an overall impression of stressing factors present (and perhaps inherent) in an intense operational setting. The setting selected for this study was the Rapid Deployment Force Exercise (Red Flag) at Nellis AFB. As a result of this study, several operational factors, especially if taken together, have been identified as compromising air crew safety.

d. "Project PHEN-X: A Pilot Project in Physiological/Human Factors in Tactical Air Operations." *Operational Problems in Aerospace Physiology Symposium*, USAF School of Aerospace Medicine, Brooks AFB, TX., January 1981. (Presentation)

I presented the major findings of Project PHEN-X to Aerospace Physiologists, Physiological Training Supervisors, and scientists involved in human factors research.

Research on Hyperbaric Oxygen and Microorganisms

4. GASEOR, Randal A., Captain and Assistant Professor

a. "Storage Lagooning as a Form of Waste Water Treatment." (Research)

Lagooning as a form of Waste Water treatment has been practiced on a worldwide basis for many years. Storage lagoons or ponds can provide intermediate treatment of waste water through biological action, solids deposition and pathogen reduction. I investigated several environmental parameters in the use of lagoons at the Air Force Academy. I am presently preparing a major technical report summarizing five years of work in this area. Funds for this research have been supplied by the U.S. Army Cold Regions Research and Engineering Laboratory, Hanover, New Hampshire.

5. REED, Ronald D., Captain and Assistant Professor

a. Also with G. W. Mikesell, Jr. "Radiometric Monitoring of Exposure-site Temperature during Laser Irradiation." *Physics in Medicine and Biology, 26:* 175-180, 1981. (Article)

Lt Col G. W. Mikesell, Jr. of the Laser Effects Branch, Radiation Sciences Division, USAF School of Aerospace Medicine (USAFASAM/RZL), Brooks AFB, Tx. and I present the results of a pilot study to measure temperature increases in living tissues during laser exposure. Initial tests were performed on plastics, and a few rabbit corneas were exposured to 10.6-μm radiation from a CO_2 laser. Extension of the technique to animal subjects would permit validation and improvement of existing thermal models of laser damage.

b. Also with Dr. J. Taboada and G. W. Mikesell, Jr. "Response of the Corneal Epitheluim to KrF Excimer Laser Pulses." *Health Physics, 40:* 677-683, 1981. (Article)

This article describes the response of the corneal epithelium of Dutch-belted rabbits to 50-nsec pulses of KrF excimer laser radiation. Such excimer lasers have potential usefulness in isotope separation, photochemistry and underwater communications. The study is the first of laser-induced corneal damage under such far-ultraviolet, ultrashort-pulse conditions.

c. Also with G. W. Mikesell, Jr. "Infrared Radiation and the Cornea: Laser Thermokeratoplasty and Functional Probes." *The Physiologist, 24 (4):* 69, 1981. (Abstract)

A presentation of the data is scheduled for the fall, 1981 meeting of the American Physiological Society. The research involves the use of laser radiation to mold corneal shape, with possible clinical applications. Certain near-infrared laser wavelengths are suggested as candidates for affecting deeper layers of the eye in future research studies.

6. SOMERSON, Norman L., Ph.D. and Distinguished Visiting Professor

a. "Isolation of a Cell Wall Deficient Organism Producing Hybrid Sterility in *Drosophila Paulistorum.*" (Research in progress)

These are six semispecies in the neutropical complex of the fruit fly, *Drosophila Paulistorum*. Intersemispecific hybrids can be produced, but hybrid males are sterile. Hybrid females produce fertile daughters and sterile sons. The sterility appears to be transmitted by an infectious agent. The agent induces sterility only when transferred from its original semispecies. A cell wall deficient (CWD) form has been isolated from the male reproductive tracts of *D. Paulistorum* Mesitas. When the CWD was injected into Mesitas females, which were then mated with Mesitas males, all the sons were fertile. Injecting the CWD into female *D. Paulistorum* Santa Marta, a different semispecies, which are subsequently mated with Santa Marta males, produced sterile male progeny. It appears that both the naturally occurring sterility and the sterility acquired through inoculation with our isolated CWD is semispecies specific.

Field studies in Environmental Impact

7. TOOLE, Joseph E., Captain and Instructor

a. "Bird Population Study in the West Monument Creek Area of USAFA." (Research in progress)

The purpose of this project is to establish a research site on the USAFA reservation for assessing bird population over a long-term period. Present plans are to have cadets actively involved in this research via the Bio Sci 499 Independent Study course. Several subsequent projects are anticipated. These include the assessment of small animal populations and the correlation of plant types with animal species. This entire effort is part of a major Front Range animal population study sponsored and funded by the Denver Museum of Natural History.

8. WEBB, James T., Major and Assistant Professor

a. Also with Dr. G. W. Brown, Jr. "Glutamine Synthetase Activity in Subdivisions of Brain of the Shark, *Squalus Acanthias.*" *Experientia* 36: 903-904, 1980. (Article)

We present data on specific activity of glutamine synthetase in *Squalus acanthias* (Spiny dogfish) central nervous system regions. Activity was highest in the cerebellum and lowest in the spinal cord. The levels of activity may relate to the excitability of each region by regulating the glutamate pool.

b. "Enzymes of Glutamate and Glutamine Metabolism in Brains." (Research)

Glutamate, an excitatory neurotransmitter, is combined with ammonia to form glutamine by enzymic action in the brain. The metabolic recycling of glutamate and its connection with glutamine will be investigated in bovine brain with enzymological methods. The goal of this study is to identify the metabolic pathway of recycling glutamate and other neurotransmitters.

CHAPTER E
Department of Chemistry

1. ALCORN, Richard L., Captain and Instructor

a. "Citizens' Workshops on Energy and the Environment." (Presentation/Workshop)

The Citizens' Workshops on Energy and the Environment is a program designed to increase the public awareness of the energy problem. The analog energy simulator is used to present different possible scenarios of energy supply, demand, growth and environmental effects. The most effective presentations are possible with groups of 40 or less where the group members can participate in the decision making process with respect to the simulator.

In the past year, 95 small group presentations were given to a total of 3500 people. This includes 70 presentations to junior high and high school students, 2 presentations to USAFA classes, 7 presentations to military organizations, 13 presentations to service clubs, and 3 presentations to college students. In addition to these presentations, the simulator was shown to over 6500 people as a part of booth displays at several energy and technology fairs.

The following members of the Departments of Chemistry and Physics gave Citizens' Workshop presentations in the past year:

Col Harvey Schiller
Lt Col James Wright
Lt Col Thomas McCann
Maj Hans Mueh
Maj Ronald Watras
Maj John Landers
Capt Richard Alcorn
Capt Richard Davis
Capt Elroy Flom
Capt John Klube
Capt Thomas Wynn

2. AVILA, Walter B., Captain and Instructor

a. Research is in progress on the fluorination of organometalics with xenon difluoride (XeF_2). The investigation includes the effect of solvent, temperature, organometalic structure, and effect of added $FB_3 \cdot Et_2O$ on the fluorination reaction. (Research in progress)

b. Also with A. I. Meyers. "Solvent and Base Studies on the Site of Aryl Metalation of 2-(3,5-Dimethoxyphenyl)-4, 4-Dimethyl-2-Oxazoline." *Tetrahedron Letters, 32,* 3335 (1980).

The position of metalation and alkylation in aryl oxazolines and diethylamides vary drastically when the base (RLi) and solvents are varied.

c. Also with A. I. Meyers. "The Chemistry of Aryl Oxazolines. Applications to the Synthesis of Lignan Lactones." Submitted to *Journal of Organic Chemistry.* (Forthcoming article)

We investigated the synthesis of several lignan lactones using aryl oxazolines as intermediates. Metalations on naphthyl oxazolines followed by electrophilic addition gave systems with the appropriate substituents, whereas methoxy displacement with organometallics introduced the remaining substituents. Metalations on naphthalene systems were shown to be precarious and poorly related to metalation in the benzene series.

d. "Synthesis of Lignan Lactones and Macrocyclic Natural Products Using Aryl Oxazolines. Diss. Colorado State University, December 1980. (Dissertation)

The goal of this research was to develop, refine, and extend aryl oxazoline methodology and to use it in the synthesis of aryl naphthalene lignan lactones, macrocyclic natural products, and their analogs. The synthetic methods developed were aimed at the synthesis of 13 aryl naphthalene lignan lactones and 4 macrocyclic natural products. The target molecules were of interest for their possible medicinal and cancer chemotherapeutic uses.

3. BURGGRAF, Larry W., Major and Instructor

a. Also with D. Kendall and D. E. Leyden. "Chemical and Spectroscopic Characterization of Modified Surfaces." 8th Annual Meeting, Federation of Analytical Chemistry and Spectroscopy Societies, Philadelphia, PA. 20-25 September 1981. (Presentation)

Chemical modification of oxide surfaces is easily performed by reacting alkyloxysilanes with the surfaces. In this study, siliceous surfaces were chemically modified with various amines, amides, and β-diketones. Chemical methods and several spectroscopic techniques including Fourier transform infrared spectroscopy, solid state carbon-13 nuclear magnetic resonance spectroscopy, and photoacoustic spectroscopy were used to study properties of the modified surfaces.

b. Also with D. E. Leyden. "Quantitative Photoacoustic Spectroscopy of Intensely Light-Scattering Particulate Samples." 8th Annual Meeting, Federation of Analytical Chemistry and Spectroscopy Societies, Philadelphia, PA. 20-25 September 1981. (Presentation)

Photoacoustic spectroscopy of solids has recently experienced a revival following a long period of neglect since the phenomenon was discovered by Alexander Graham Bell. This technique has potential for quantitative measurements of absorption spectra of powders. The theory of photoacoustic spectroscopy has been modified to account for the effects of light-scattering in particulate samples. Applications are made to the study of chemically modified surfaces and metal-alumina catalysts.

c. "Photoacoustic Studies of Complexation of Copper (II) with an Ethylene-Diamine Analog Immobilized on Silica Gel." *Analytica Chimica Acta, 129* (1981), 19-27. (Article)

Photoacoustic spectroscopy and solid-solution distribution measurements were used to study the complexation of Cu^{2+} ions with an immobilized ligand. Evidence was found for two kinds of binding sites: sites which exhibit 2 to 1 ligand to metal binding and sites which exhibit 1 to 1 ligand to metal binding. Heterogeneous distribution measurements were fit to a model which assumes two independent types of binding sites.

d. "Quantitative Photoacoustic Spectroscopy of Intensely Light-Scattering Thermally Thick Samples." *Analytical Chemistry, 53* (6), (1981), 759-764. (Article)

The Rosencwaig-Gersho theory for photoacoustic spectroscopy of condensed phases is extended to include light-scattering thermally thick samples. Photoacoustic magnitude and phase information are combined in a response function which is linear with chromophore loading over 2 orders of magnitude. An illustrative example is made to chemically modified silica.

e. "Photoacoustic Spectroscopy of Chemically Modified Surfaces." Diss. University of Denver, 14 August 1981. (Dissertation)

I deal with theory and practice of photoacoustic spectroscopy as applied to the study of chemically modified surfaces including silica surfaces modified by silylation and alumina-supported metal catalysts.

4. CAVENDER, V. Claude, Jr., Major and Assistant Professor

a. "Chemical Structure/Bonding Decomposition Relationships of Energetic Materials." (Research in progress)

This project is in support of ongoing research of energetic materials (explosives) at the Air Force Armament Laboratory and the Air Force Rocket Laboratory. Maintaining the physical and chemical integrity of explosives under various environmental conditions has long been a concern to the Air Force. The purpose of this research is to determine the mechanisms of thermal decomposition of various explosives. Synthesis of isotope-labelled high energy materials for electron spin resonance analysis of their decomposition is an immediate objective.

5. BRAYDICK, M. D., Captain and Instructor.

a. Cacibration Method for Solid State Chloride Ion Electrodes in Hydrogen Peroxide/Strong Base Solutions." *See* E9b.

6. DAVIS, Larry P., Captain and Instructor

a. "Molecular orbital calculations on explosives molecules." (Research in progress)

These calculations are designed to deduce the reaction mechanisms for the thermochemical and photochemical decomposition of these explosives. TNT and related compounds are being studied through the use of smaller model compounds. We have almost completed the study for the initial step of TNT decomposition with these model compounds. Calculations have recently begun on model compounds for the HMX-RDX nitramine type of explosives.

b. Also with W. R. Carper, R. C. Dorey, H. L. Pugh, A. G. Turner, K. E. Siegenthaler, and J. S. Wilkes. "Decomposition of TNT: Radical Identification and Theoretical Studies," FJSRL-TR-81-0002, May 1981. (*Report*)

This TR identifies one of the early decomposition products in TNT thermal decomposition. Progress through April 1981 on theoretical modelling studies of this process is given also.

c. Also with W. R. Carper, R. C. Dorey, H. L. Pugh, A. G. Turner, K. E. Siegenthaler and J. S. Wilkes. "First steps of the Thermochemical Decomposition of Molten 2,4,6-Trinitrotoluene," 181st National ACS Meeting, Atlanta GA. April 1981. (**Presentation**)

Presentation of material in item E6b.

d. Also with M.J.S. Dewar, R. M. Guidry, H. S. Rzepa, and J. R. Williams. "MNDO Calculations for Compounds Containing Aluminum and Boron." Accepted for *Journal of Computational Chemistry*. (Article)

The appropriate parameters for doing calculations on aluminum-containing molecules are given in this paper. We did extensive testing of the calculations by comparison to known chemical properties of a variety of compounds containing aluminum and boron.

e. Also with R. C. Dorey, H. L. Pugh, and J. S. Wilkes. "Photochemical Decomposition of Nitroaromatics in Ether Solvents." Accepted by *Journal of Physical Chemistry*. (Article)

We performed investigations on photochemical decomposition of TNT and related compounds in ether solvents. Decomposition products are identified and a mechanism previously proposed in the literature is confirmed.

f. Also with W. R. Carper and M. W. Extine. "The Molecular Structure of 2,4,6-Trinitrotoluene." Accepted by *Journal of Physical Chemistry*. (Article)

We paid for a crystal structure determination of TNT by Molecular Structure Corporation. The paper contains the experimental structure obtained in comparison with theoretical calculations, and analysis of the intermolecular forces in the TNT crystal.

g. Also with W. R. Carper, R. C. Dorey, H. L. Pugh, and J. S. Wilkes. "Thermal Decomposition of RDX Below the Melting Point." Proceedings of the Seventh Symposium (International) on Detonation, Annapolis, MD. June 1981. (Presentation)

Rate information on the decomposition of mixtures of TNT and RDX were presented and included in the proceedings. The data gave information about potential decomposition mechanisms for these important explosives.

h. "MNDO Study of the Reaction of Chlorine with Basic Hydrogen Peroxide "
See E19b

7. DIETER, Kenneth M., Captain and Instructor

a. "Mechanistic Studies of the Deuteration of the Methyl Group of TNT." (Research in progress)

Gas chromatograph/mass spectrometer analysis is being used to ascertain the chemical mechanism for the deuteration of the methyl group of TNT. Information derived from this research will be used to determine the best reaction conditions for deuterating energetic materials for thermal decomposition studies

8. DRUELINGER, Melvin L., Ph.D and Distinguished Visiting Associate Professor

a. "Fluorinations of Organometallics with Xenon Difluoride and Synthesis and Chemistry of Tetrazines." (Research in progress)

The use of reactive organometallics, especially Grignard reagents, with XeF_2 is being exployed to find routes to selectively fluorinate organic materials. Efforts are continuing to find routes to polynitoaromatic tetrazines. New oxidation procedures and mild nitration methods are of key concern. The resulting compounds are expected to be of interest as high energy, low hydrogen content materials.

b. Also with G. W. Erickson, A. I. Meyers, S. White, and D. R. Williams. "Enantioselective Alkylation of Ketones via Chiral, Nonracemic Lithioenamines. An Asymmetric Synthesis of α-Alkyl and α,α′-Dialkyl Cyclic Ketones." *Journal of the American Chemical Society, 103*, 3081 (1981). (Article)

Chiral molecules of exceptionally high optical purity have been synthesized from cyclic ketones utilizing chiral amines and lithium. This important synthetic advance has potential application in understanding specificity in syntheses involving enzymes.

c. Also with J. S. Wilkes, J. A. Levisky and C. L. Hussey. "Dialkylimidazolium Chloroaluminate Molten Salts." *Proceedings of the Third International Symposium on Molten Salts (The Electrochemical Society)*, in press. (Article)

A series of 1-methyl-3-alkylimidazolium chlorides was synthesized and chloroaluminate melts were prepared from them. The new melts have favorable physical properties and wider electrochemical windows than earlier organic melts. Applications of Air Force interest include the use of these materials for high density batteries.

d. Also with R. A. Hildreth and S. A. Shackelford. "Xenon Difluoride Fluorination. IV. Photochemically Initiated Xenon Difluoride Fluorination of Norbornene." (Article—submitted to *Tetrahedron Letters*)

Norbornene has been selectively fluorinated using XeF_2 and light to give 2,3-difluoronorbornane isomers and solvent adducts. This is the first example of light initiated XeF_2 fluorination.

e. Also with W. D. Closson, R. A. Hildreth, and S. A. Shackelford. "Novel Nitroaliphatic Compounds. I. Nitroenynes." (Article—submitted to *Journal of Organic Chemistry*)

Several examples of a novel new class of energetic materials containing a fluorine and a nitro group on the terminus of an enyne functionality have been synthesized and characterized. Potential applications of Air Force interest include the incorporation of these monomers into an energetic polymer which could be used as a rocket propellant binder.

f. Also with R. A. Hildreth, R. L. Wallace and D. A. Webster. "Synthesis and Characterization of Bis-Fluorodinitroethylalkyl Ethers: New Energetic Plasticizers." (Article—manuscript in preparation)

A new class of energetic plasticizers for use in explosive and propellant formulations has been synthesized. These plasticizers have been developed specificially for use with a similarly structured polymer previously developed in this laboratory (FJSRL). Preliminary evaluation of these materials indicates a high degree of both thermal and hydrolytic stability as well as compatibility with normal explosive and propellant ingredients.

g. Also with R. A. Hildreth, L. P. Davis and N. M. Ely. "Xenon Difluoride Fluorinations. V. Mechanism and Stereochemistry of Photochemically Initiated Reaction of Xenon Difluoride with Norbornene." (Article—manuscript in preparation)

The photochemical fluorination of alkenes with XeF_2 has been examined using norbornene as a mechanistic probe. The stereochemistry of the products has been determined using NMR and mass spectroscopy and X-ray crystallogrphy. The product distributions and ESR spectroscopy support a mechanistic pathway involving free radicals.

h. "Dialkylimidazolium Chloroaluminate Molten Salts." Third International Symposium on Molten Salts (The Electrochemical Society), Hollywood, FL. October 1980. (Presentation)
See E8c.

i. Also with C1C L. Connell. "High Energy Materials Chemistry: Tetrazines." American Chemical Society Meeting-in-Miniature, Colorado Springs, CO. 11 April 1981. (Presentation)

In search of new high energy materials, a series of tetrazines has been synthesized and characterized. A new oxidation procedure using quinones has been explored. Nitrations have been attempted.

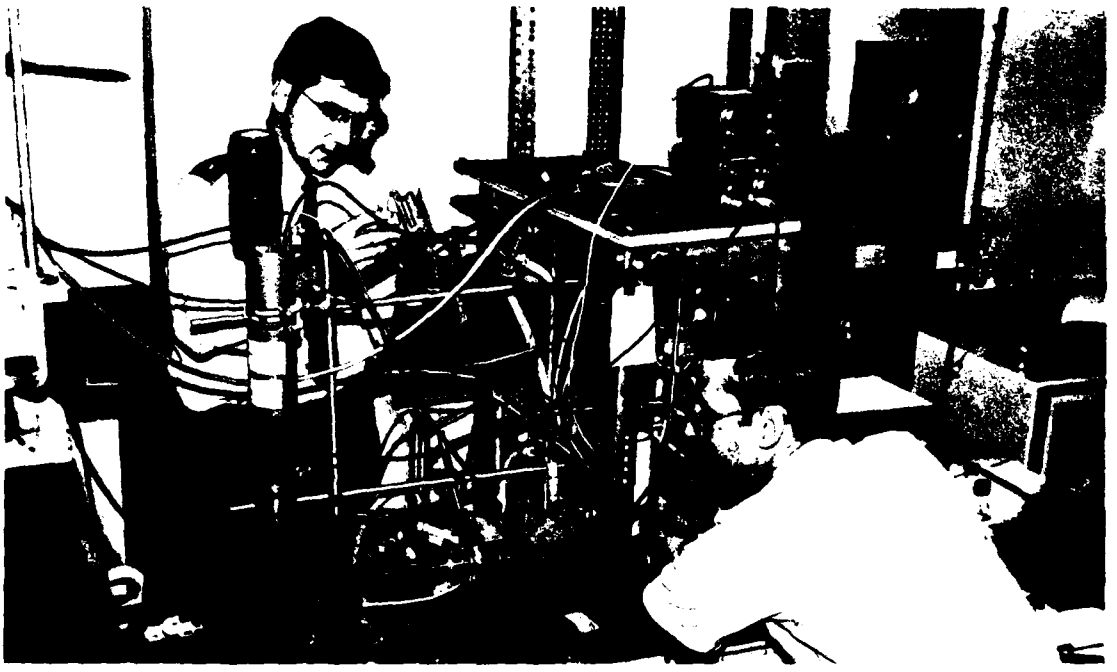
j. Also with C1C J. Marlin II. "Aromatic Tetrazines: Synthesis and Nitration." American Chemical Society *Meeting-In-Miniature*, Colorado Springs, CO. 11 April 1981. (Presentation)

Tetrazines, a relatively unexplored class of heterocycles have been synthesized. Refinements in analytical techniques revealed the presence of previously unrecognized thiadiazoles. Efforts have begun to nitrate the tetrazines to generate high energy materials of potential Air Force interest.

k. Also with C1C J. Fryling. "*Tetrazines and Their* Diels-Alder Chemistry: An Undergraduate Laboratory Experiment." American Chemical Society Meeting-in-Miniature, Colorado Springs, CO. 11 April 1981. (Presentation)

A novel undergraduate experiment illustrating the use of heterocycles in the Diels-Alder reaction has been developed. The multi-step synthesis involving a series of color transformations provides a valuable learning tool for students.

l. "Tetrazines: Synthesis and Chemistry." University of Colorado, Colorado Springs, CO. 19 March 1981. (Presentation)



Major Chet Dymek and Captain Larry Davis prepare chemical generator of $O_2{}^1\Delta$ for flow experiments

9. DYMEK, Chester J., Jr., Major and Associate Professor

a. "Chemical Aspects of High Energy Lasers." (Research in progress)

Transfer of energy from chemically produced excited oxygen ($O_2{}^1\Delta$) to iodine (I_2) is the basis of a high energy laser under development by the Air Force Weapons Lab. The excited oxygen dissociates the I_2 into iodine atoms which are then excited by the $O_2{}^1\Delta$ to an excited state which lases. This research investigates the factors bearing on the efficient chemical production of $O_2{}^1\Delta$ and on the mechanism by which the I_2 is dissociated into iodine atoms. Sponsored by Frank J. Seiler Research Lab

b. Also with M. D. Braydich, M. E. Cummings, and L. E. Myers, "Calibration Method for Solid State Chloride Ion Electrodes in Hydrogen Peroxide Strong Base Solutions," EJSRI Technical Report ST-0004, April 1981. (Technical report)

The technique for using ion selective electrodes to determine [Cl⁻] concentration in a solution of basic hydrogen peroxide is presented. This is the solution in which O_2^{-1} is generated by reaction of hydrogen peroxide with chlorine. Monitoring Cl⁻ during the course of the reaction yields important data on the reaction mechanism.

c. "MNDO Study of the Reaction of Chlorine with Basic Hydrogen Peroxide."
See E-19b

d. "Factors Affecting O_2^{-1} Generation Efficiency in Small-scale Batch Reactor." (EJSRI Tech Report in preparation)

This report covers investigation of the effects of various reactor parametes on efficiency of O_2^{-1} production (i.e. reaction of basic hydrogen peroxide and chlorine). It includes variations in concentrations, pH, and in reactor trap surfaces.

10. ELLIOTT, Alverton A., Jr., Captain and Assistant Professor

a. Effects of Oxygen Under Pressure on Growth of *Aspergillus fumigatus*. (Research in progress)

Hyperbaric oxygen has been used for treatment of a limited number of diseases of man caused by fungi. This research project is to provide data for understanding basic effect of hyperbaric oxygen on metabolic (biochemical) pathways of *A. fumigatus* that may lead to more effective treatment of human fungal diseases. Research is partly sponsored by Frank J. Seiler Research Lab and will be used for my Ph.D. at the University of Oklahoma.

Captain Al Elliott examines a sample of aspergillus fumigatus fungal growth, part of his biochemical research on hyperbaric effects of oxygen on fungal growth.

11. HOLWITT, Eric A., Captain and Instructor

a. "I. Binding of fd Gene 5-Protein to DNA. II. Structural Changes of DNA Upon Chemical Ethylation." Diss. Columbia University, July 1981. (Dissertation)

Gene 5-protein of fd phage was found to bind to single and double-stranded DNA. It slowly changed the hydrodynamic shape of fd DNA, as indicated by sedementation and viscosity. Gene 5-protein was unable to cause complete strand separation in DNA. When DNA is ethylated with diethyl sulfate, the major site of ethylation was N-7 of guanine. The ethylated DNA slowly depurinated with time, leading to a loss of viscosity and a decrease in Tm.

12. JUNG, Phillip, Captain and Instructor

a. "Synthesis of 1-Alkoxy-6-nitro-1,2,3-benzotriazoles and 1-alkoxy-6-amino-1,2,3-benzotriazoles." Thesis submitted in partial fulfillment of the requirements for the degree of Master of Science, Wright State University, OH, June 1981. (Thesis)

A series of substituted 1,2,3-benzotriazoles compounds was synthesized. These compounds have potential physiological activities as anti-neoplasm agents and as pesticides.

13. LANDERS, John S., Major and Assistant Professor

a. "A study of the characteristics of a ternary melt: dialkylimidazolium chloride aluminum chloride solvent."

The binary system in item d. shows promise for use in high energy density batteries. Although the electrolyte is already molten at room temperature, I am attempting to improve the conductivity of this system by including a solvent such as acetonitrile in the melt. (Research in progress)

b. "Lithium: Cryptand 2.1.1 Electrides: A Study of Some Magnetic and Optical Properties." Diss. Michigan State University, March 1981. (Dissertation)

This work focuses on the characteristics of the dark blue microcrystalline powders produced from lithium metal and the cation complexing agent cryptand 2.1.1. The lithium cation is complexed inside the cryptand and the electron appears to be "free" in the crystalline structure. Hence the material is a member of the new class of compounds called "electrides" in which the anion is only an electron. Samples show reversible, temperature-dependent spin-pairing processes which are essentially complete by 3K and which depend upon the mole ratio of metal to complexer.

c. Also with James L. Dye, M. J. Sienko and Angelica Stacy. "Temperature-Dependent Electron Spin Interactions in Lithium 2.1.1 Cryptate Electride Powders and Films." *J. Phys. Chem.*, 85, 1096 (1981). (Article)

Optical spectra show that films of lithium and cryptand 2.1.1 contain trapped electrons. Electron paramagnetic resonance intensites and static magnetic susceptibilities indicate that most of the electrons participate in temperature dependent spin-pairing processes which yield Curie-Weiss behavior from 70-230K. The results are consistent with an F-center model in which electrons occupy vacancies between closest-packed cryptated cations.

d. Also with Charles L. Hussey, Joseph A. Levisky and John S. Wilkes. "A New Class of Room Temperature Molten Salts for Battery Applications." 1981 NAVMAT Science and Engineering Symposium, Wright-Patterson AFB, OH, 27-29 October 1981. (Presentation)

A new class of salts is reported which are liquids considerably below room temperature. Mixtures of dialkylimidazolium chlorides and aluminum chloride were studied over a wide mole fraction range. A proof-of-concept battery has been demonstrated using a particular mole fraction of this new electrolyte.

14. LINNEMANN, Jean I., Captain and Instructor

a. "ADA Language" (Research in progress)

Investigation of methods to introduce and teach the new DOD Standard Programming Language for embedded computers (ADA) to both novice and experienced Air Force computer personnel.

b. "ADA Software Engineering." Military Personnel Center, Randolph AFB, TX. 24-28 August 1981. (Presentation)

A pilot course in ADA using object-oriented design techniques. Thirty-five Air Force personnel experienced in computer programming attended the course.

15. MOODY, Harvey W., Captain and Associate Professor

a. "Laser Potentials." (Research in progress)

Studies have revolved around identifying the species formed in a Te/F_2 flame for possible laser action. The work thus far confirms the presence of TeF, TeF_2, TeF_3 and TeF_5. What remains to be accomplished is the maximation of the yield of TeF, the species most likely to have laser potential.

b. "Atomic Spectroscopy." University of Colorado at Colorado Springs, CO. 27 February 1981. (Presentation)

I presented a survey of atomic absorption and inductively coupled plasma spectroscopy theory and applications.

c. "High Performance Liquid Chromatography (HPLC)." USAF Academy, CO. 23 September 1981. (Presentation)

A seminar and workshop on the theory and applications of HPLC was presented to the USAFA Department of Chemistry personnel. This seminar was presented in conjunction with the Department's Continuing Education Program.

16. MUEH, Hans J., Major and Tenure Associate Professor

a. "A Basic Approach to Laboratory Work." (Research in progress)

Development of low-cost laboratory modules employing the use of many practical examples of basic chemical principles, use of apparatus constructed by each student from inexpensive materials, reduction in the scale of experiments making laboratories safer and less costly, and inclusion of student designed research projects.

b. "Creation and Development of an Honors Course in Chemistry." *Directory of Teaching Innovations*, published by the Division of Chemical Education, American Chemical Society, Fall 1981. (Article)

A summary of the format, content and innovations introduced in the Honors Course in Chemistry. The course was first offered in Fall 1980 to 200 cadets in the Class of 84.

17. SCHILLER, Harvey W., Colonel and Permanent Professor

a. "The Crash of LOT Flight 007." U.S. Amateur Boxing Federation at the Amateur Athletic Union National Convention, Miami Beach, FL. 1 December 1980. (Paper and Presentation)

The paper was a report on the identification and return of the USA National Boxing Team killed in the crash of Polish Airlines Flight 007 on 14 March 1980.

b. "Leadership." USAF Academy, CO. 16 March 1980. (Presentation)

I presented the elements of leadership to the USAF Academy Air Command and Staff Seminar.

18. SHAFER, Alan A., Captain and Instructor

a. Also with R. E. Cochoy. "Fluoroalkylene Ether Silicate/Viton GLT Blends: An Approach Toward Improved Low Temperature Flexibility," *Journal of Applied Polymer Science*, in press. (Article)

Fluoroether polymers having low glass transition temperature properties were synthesized and used in elastomer compounding as co-curing reactive plasticizers. The low temperature flexibility of a commercial fluoroelastomer made by DuPont (Viton GLT) was enhanced by this blend approach. The goal of this research was to enhance fluid containment of o-ring hydraulic seals in broad temperature applications. Loss of hydraulic fluid due to seal leakage has been one of the ten highest operations and maintenance costs in the Air Force.

19. STORCH, Donn M., Captain and Assistant Professor

a. "Studies of Excited Oxygen." (Research in progress)

This work involves a theoretical calculation approach to studying the mechanism in which excited oxygen, $0_2(^1\Delta)$, is chemically generated. I am currently investigating processes which may occur in the solution of basic hydrogen peroxide and chlorine. Some of these processes may compete with the production of molecular oxygen to reduce the chemical efficiency.

b. Also with L. P. Davis, C. L. Dymek, and L. E. Myers. "MNDO Study of the Reaction of Chlorine with Basic Hydogen Peroxide." 1981 Joint Meeting, Central and Great Lakes Regions of the American Chemical Society, Dayton, OH. 20-22 May 1981. (Presentation)

The MNDO method of semiempirical quantum mechanical calculations was used to study various combinations of species. Two pathways were identified which can produce molecular oxygen in the ($^1\Delta$) state. Triplet energy surfaces were similarly studied to identify competing processes which may produce ground state oxygen.

20. WELLMAN, Michael W., Captain and Instructor

a. Also with T. Helminiak, W. F. Hwang, D. Wiff, V. Rodgers, and C. Benner. "Critical Processing Conditions of a Specific Ternary System—Molecular Composite." AFWAL-TR-80-4163.

The phase relationships and critical processing conditions of a rigid rod-like polymer (poly-p-phenylenebenzothiazole) in a flexible chain polymer matrix (poly-2,5(6) benzimidazole) was studied to determine the conditions for the coexistence of anisotropic and isotropic phases. The work is part of the Ordered Polymer Program jointly sponsored by the Materials Laboratory and AFOSR. The direction of the research is to develop high-temperature and environmentally resistant polymers for structural use in Air Force applications.

21. WRIGHT, James R., Lt Colonel and Tenure Associate Professor

a. "Isolation and identification of the pigment materials found in the pink root fungus, *Pyrenochaeta terrestris*." (Research in progress)

b. "Biochemistry of the Pink Root Organism, *Pyrenochaeta terrestris*." Department of Chemistry, University of Colorado at Colorado Springs, CO. 7 May 1981. (Presentation)

I discussed (a) the pigment production, (b) the carbohydrate nutrition and composition, and (c) certain selected enzyme studies involved in carbohydrate metabolism in the fungus, *Pyrenochaeta terrestris*..

c. "Necessary, Ordinary and Unique—the Water Molecule." Science Colloquium, Pikes Peak Community College, Colorado Springs, CO. 6 November 1980. (Presentation)

I gave a seminar outlining the many unique properties possessed by the common substance, water.

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CHAPTER F
Department of Civil Engineering

1. BARTEL, H. D., Major and Associate Professor

a. "An Investigation of the Dynamic Response of a Seismically Stable Platform (Platform Dynamic Response)."
See I9a.

2. BENSEN, Joel, Major and Assistant Professor

a. "Wind Turbine Siting Applications."
See I10a.

3. BOYCE, Steven C., Captain and Instructor

a. "USAF Academy Wind Site Survey; Methodologies for Use by The Air Force."
See I10c.

4. CHISOLM, Stoney P., Major and Associate Professor

a. Also with Richard Van Saun. "Ground Motion Induced Tension Spall in Soils." Sponsored by Air Force Weapons Laboratory, Kirtland AFB, NM. (Research in progress)

Tension spall is the physical separation of originally intact near-surface material under tensile stresses created by a stress wave interaction with the air-ground interface. Such a phenomenon is likely to occur as a result of surface or near-surface nuclear detonations and may play a significant role in the resulting ground motions in the vicinity of land-based strategic weapons sytems. The major effect seems to be the creation of low frequency, large displacement ground motions at ranges that might otherwise see negligible motions.

In an attempt to better understand tension spall and its effects, we are analyzing ground motion data from several Defense Nuclear Agency-sponsored high explosive simulation tests in order to (1) identify spall-related ground motion phases; (2) determine the depth and extent of the resulting spall separation; and (3) determine the influence of geology, source configuration, and yield on tension spall.

The results of this investigation may play a significant role in the development of an analytical model capable of predicting the depth and extent of tension spall in soils due to high explosive or nuclear-induced ground motions.

5. COSGROVE, Richard D., Lieutenant and Research Assistant

a. "Dynamic Responses of a Nano-G Stable Platform."
See F7a.

6. DUSTIN, Jacob D., Captain and Assistant Professor

a. Also with Marcos J. Madrid and Joseph Smith. "A Model Comparison Study of Boiler Emissions In Complex Terrain." Sponsored by Headquarters Air Force Engineering and Services Center, Tyndall AFB, FL. (Research in progress)

This project will record the dispersion and desposition patterns of emissions generated by the USAF Academy Heating Plant #1. The field data obtained by a monitoring network will be compared with concentration predicted by the point source portion of the Air Force Air Quality Assessment Model.

This project will consist of five main research phases: (1) An existing heating plant boiler stack will be instrumented to monitor the emissions; (2) A field sampling network will be installed on the USAF Academy Reservation; (3) A tracer gas will be injected into the stack effluent, the emissions monitored, samples collected, analyzed, and recorded; (4) Dispersion models will be run to predict the tracer concentrations at the receptor stations, then the model output will be compared with field observations; and (5) An evaluation will be performed and recommendations made on the future use of AQAM in AF coal conversion projects, specifically in the environmental analysis process.

7. HANES, Richard M., Major and Assistant Professor

a. Also with Richard D. Cosgrove. "Dynamic Response of a Nano-G Stable Platform." (Research in progress)

SDRC MODAL-PLUS was used to determine experimentally the natural frequencies and mode shapes of a prototype isolation pad located at Holloman AFB. Structure response was obtained using both impact and random excitation. These results will be used to verify finite element models and contractor compliance with design specifications.

b. Also with Francis S. Heming and B.J. Simmons. "Dynamic Analysis of Test Platforms." (Research in progress)

The dynamic response of two seismically stable test platforms was investigated. One, the ISOPAD, is located at USAFA. The other, the SSP, is a prototype design constructed at Holloman AFB, N.M. Experimental data in the form of impact and random force input and acceleration output was collected and analyzed using the SDRC MODAL-PLUS computer program. Natural frequencies and mode shapes of both structures were determined and compared to previous findings and contractor predictions. Future efforts will be directed toward developing finite element models of test platforms which will accurately model structural characteristics and performance and permit an analytical investigation of proposed design changes.

c. "An Investigation of the Dynamic Response of a Seismically Stable Platform (Platform Dynamic Response)."
See I9a.

d. "Dynamic Analyses of Test Platform"
See I9b.

8. KEHIAS, George, Captain and Assistant Professor

a. "Wind Turbine Sitting Applications."
See I10a.

9. MADRID, Marcos T., Major and Assistant Professor

a. "A Model Comparison Study of Boiler Emissions In Complex Terrain."
See F6a.

10. RHYE, Ralph, Captain and Instructor

a. "Wind Turbine Siting Applications."
See I10a.

11. SMITH, Joseph, Lieutenant and Research Assistant

a. "A Model Comparison Study of Boiler Emissions In Complex Terrain."
See F6a.

12. TOPPER, Dennis R., Major and Associate Professor

a. "Computer Graphics." (Research in progress)

This project has three objectives: (1) Development of course CE 495, Computer Graphics in CE, (2) Preparation of users' manuals to facilitate incorporation of USAFA's existing computer graphics capability into civil engineering courses, and (3) Investigation of the potential for making computer-generated movies at USAFA.

13. VAN SAUN, Richard, Captain and Instructor

a. "Ground Motion Induced Tension Spall in Soils."
See F4a.

14. WIEDEMEIER, Dennis, Lieutenant Colonel and Associate Professor

a. "Wind Turbine Siting Application."
See I10a.

b. "USAFA Vertical Axis Wind Turbine."
See I10b.

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CHAPTER G
Department of Economics

The Variable Housing Allowance Report Team meets with the Department of Economics to gain feedback for the report

1. ANSELMI, Michael S., Major and Associate Professor

a. Also with Franklin L. Gertcher, Michelle D. Johnson, and William J. Weida. "An Economic Evaluation of Variable Housing Allowances in the Colorado Springs Military Housing Area." (Forthcoming technical report)

We studied the Variable Housing Allowance (VHA) program in the local area. We found that VHA amounts for officers were about right, for E-7 through E-9 were too high, and for E-1 Through E-4 were too low. We recommend that the Department of Defense modify the VHA entitlement calculation, calculate the entitlement annually but update it quarterly to adjust for inflation, and educate all military members on how the entitlements are calculated.

2. GERTCHER, Franklin L., Major and Assistant Professor

a. "An Economic Analysis of Military Family Response to the Current Department of Defense Military Family Housing Program." Diss. University of Hawaii, 1981. (Dissertation)

I provide a method for explaining the effects of the current Department of Defense (DOD) Housing Program on military family housing choice behavior. I additionally provide a method for evaluating the current DOD Housing Program in terms of social benefits and costs, and in terms of whether it achieves its stated purpose of increasing the amount of housing service consumed by military families.

b. "An Economic Evaluation of Variable Housing Allowances in the Colorado Springs Military Housing Area." *See* G1a.

c. "Military Family Housing Compared to Private Housing: Alternative Amounts of Housing Service." Submitted to the *Review of Social Economy*, April 1981. (Article)

I provide a method for determining whether the current Department of Defense Military Family Housing Program induces military families to consume more or less housing service than they otherwise would in the private housing market.

d. "Military Family Housing Compared to Private Housing: A Benefit-Cost Model." Submitted to the *Public Finance Quarterly*, April 1981. (Article)

I provide a method for determining whether the current Department of Defense Military FamilyHousing Program is economic according to the criterion that social benefits exceed social costs.

e. Also with William J. Weida. "Military Weapon Systems Expenditures and Risk: Theory and Evidence." Submitted to *Policy Analysis*, July 1981. (Article)

We take issue with the popular view that the improvement of the weapon system acquisition process will result in lower weapon system costs. We cite ethical and risk factors as the actual determinants of cost.

f. "A Model of Housing Choice Behavior for Military Families." Submitted to the *American Economic Review*, April 1981. (Article)

I provide a multinomial LOGIT model which explains the effects of the current Department of Defense Housing Program on military family housing choice behavior in a three sector housing market.

3. JOHNSON, Melvin N., Major and Assistant Professor

a. "A Discriminant Analysis of the Factors Affecting Migration Changes in Nonmetropolitan Counties in Georgia 1960-1975." (Dissertation in progress)

To date, no one has clearly identified the distinguishing characteristics of growing as opposed to stable or declining nonmetropolitan communities in Georgia. I am empirically investigating the recent occurrence of migration reversals in nonmetropolitan counties in Georgia and I hope to identify the factors responsible for the growth turnaround.

4. JOHNSON, Michelle D., Lieutenant and Research Assistant

a. "An Economic Evaluation of Variable Housing Allowances in the Colorado Springs Military Housing Area."

See G1a.

5. KOOL, Leslie H., Major and Assistant Professor

a. "China in Transition (1978-1980): Effects on the Efficiency of Production." USAF Academy Technical Note 81-3 (March 1981). (Note)

I address potential changes in the efficiency of production in agriculture and industry that may be associated with Chinese structures and incentive mechanisms of recent development.

6. MORSE, Kenneth O., Captain and Instructor

a. "Probabilistic Weapons Systems Costs." (Forthcoming technical report)

I explain how the philosophy of "probabilistic kill" affected the expenditure of Department of Defense funds during the past 20 years. The Air Force Weapons Laboratory sponsored my research.

Captain Ken Morse enters his report on probabilistic weapon system costs into the USAFA word processor

7. RANEY, Terry L., Captain and Instructor

a. "Multi-Year Funding: Impact on Acquisition Cost and Time." (Research in progress)

I will determine how current multi-year funding policies and laws could be changed to lower major weapon system acquisition costs and acquisition time. The Defense Systems Management College is sponsoring this research.

8. ROSEN, Harry W.,Major and Assistant Professor

a. "Project Scheduling, Budgeting, and Analysis for Underground Nuclear, High Explosive, and Nuclear Weapon Effect Simulator Tests." (Research)

I studied the applicability and merit of more sophisticated project scheduling, budgeting and analysis techniques to management of underground nuclear, high explosive, and nuclear effect simulator test programs. The Defense Nuclear Agency sponsored this research.

9. STREETS, James B., Major and Associate Professor

a. "Inflation in Economic Sectors Related to the Air Force Budget." (Research in progress)

This is a project to econometrically forecast rates of inflation in those sectors of the U.S. economy that produce investment items. I am currently developing a sufficient data base to support the estimation of appropriate econometric models which I am in the

process of specifying. I intend to utilize the skills of other faculty members as well as cadets and I do not expect to complete the project for several months.

b. "Regional Economic Development in the Soviet Union, Two Case Studies: The Baltic and Central Asia." Diss. University of Michigan, 1981. (Dissertation)

I assessed the regional differences in Soviet economic growth. In particular, I evaluated the regional impact of Soviet non-regional as well as regional economic policy.

c. "The Wealth of Nations, Revisited." First Summer Alumni College, USAF Academy, CO., 14-20 June 1981. (Presentation)

This deals with economic strengths that are substitutes for the traditional factors of production (land, labor and capital). I centered my discussion around an analysis of the institutions and operating practices of the Soviet economy.

10. WEIDA, William J., Lieutenant Colonel and Tenure Professor and Acting Head

a. "Consulting for the Cost Analysis Improvement Group." (Continuing Consultation)

The finance office of the Air Force Systems Command has requested my assistance in inflation forecasting and economic model evaluation and/or ratification.

b. "Consulting for the National Association of Church Business Administration." (Continuing Consultation)

I have advised many different denominational groups on church receipt forecasting and economic planning.

c. Also with William A. Mitchell. "Earthquakes in Turkey: Reconstruction Problems, Damage Prediction, and Recovery Forecasting for Earthen Structures." *Proceedings*, National Science Foundation Workshop on Construction of Earthen Buildings in Seismic Zones, University of New Mexico, Albuquerque, NM (September 1981). (Article)

We developed an earthquake recovery prediction model. Based on international data, the model forecasts both the magnitude and timing of economic assistance after an earthquake.

d. "An Economic Evaluation of Variable Housing Allowances in the Colorado Springs Military Housing Area."
See G1a.

e. "Military Weapon Systems Expenditures and Risk: Theory and Evidence." Submitted to *Policy Analysis*, July 1981.
See G2e.

f. "Some Fundamental Properties of Governmental Expenditure Patterns—Theory and Evidence Based on Military Expenditures." *The Journal of Technology Transfer* 5 (Spring 1981), pp. 61-76. (Article)

I modelled governmental expenditures using growth curves. The model applies to individual weapon systems as well as entire treasury cost code categories. This suggests a fundamental theory of expenditures which should allow the forecasting of foreign defense expenditures in the presence of sparse data.

g. "Using the Growth Curve to Forecast Recovery from Military - Induced Disaster."
See L3r.

CHAPTER H
Department of Electrical Engineering

1. ALSTON, Clifton J., Captain and Instructor

a. "An Analysis of Maxi-min Matched Filter Design for Communication Through a Nonlinearly Distorting Channel." The University of Illinois, 1981. (Thesis)

This is a study of the problem of antipodal signalling through a nonlinearly distorting channel. Maxi-min design criteria are presented, and general expressions are derived for the optimum filter and its performance in terms of the eigenfunctions and eigenvalues of certain additive noise autocorrelation functions. In particular, results for baseband detection in triangular-kernel noise, ideally band limited noise, and Wiener noise processes are presented.

2. ANGELL, Stewart K., Captain and Instructor

a. "Data Compression Techniques for Seismic Data. (Research)

This Rome Air Development Center sponsored project involves the study of random seismic data, the compression of the sampled data, and modeling the compression and decompression algorithms in the computer.

b. "Fast Fourier Transform Spectrum Analyzer for Modem Identification." (Research)

This Air Force Communications Command sponsored project is to investigate techniques which will identify modems using the Fast Fourier Transform method and statistical analysis of the result. A report will be published in August.

c. Also with Donald Warmuth. "Interactive Digital Communications Simulator." (Research)

This research effort will implement a computer-based Digital Communications Simulator which will enable the Air Force Academy to assist the Rome Air Development Center in modeling communication lines and assessing the performance of these lines given various system parameters. Specific designs will include modeling spread spectrum modulation, electronic warfare signals and countermeasure techniques, and several spread spectrum antenna systems.

d. "Time Division Multiplex Techniques for Interbase Radio Systems." (Consulting)

An investigation of possible systems to replace existing frequency modulation multi-net, multi-user interbase radio networks with a time-division multiplex user addressable system for AFCC.

e. "Walsh Function Doppler Radar." (Research)

A research effort to investigate the feasibility of using Walsh functions to transmit and receive signals over a broadband antenna and processing the return signals to give improved target resolution and range information.

3. ATKINS, Walter J., Jr., Major and Tenure Associate Professor

a. Also with P. L. Ransom and C. S. Gardner. "Compensation of Coherence Effects in an Optical Spectrum Analyzer" *Applied Optics* (1 June 1981), Vol. 20, No. 11, pp 1951-1954. (Article)

We describe an optical technique which is capable of compensating for the effects of imperfect spatially coherent illumination on the performance of a modified Mach-Zehnder spectrum analyzer. A system is also proposed for measuring spectral amplitude and phase in real time by using a minicomputer.

b. "Computer Network Optimization."
See H16b.

c. "Optimization of ADCCP Protocol Options for NORAD Missile Warning Display System."
See H17b.

Captain Ayers debugs a microprocessor software problem

4. AYERS, Louis M., Jr., *Captain and Assistant Professor*

a. Also with Alan R. Klayton and Joseph J. Pollard. "Microprocessors in Education at the United States Air Force Academy." 1981 Frontiers in Education Conference, Rapid City, SD. October 1981. (Presentation)

We describe and evaluate the microprocessor-oriented digital systems curriculum in the Department of Electrical Engineering at the United States Air Force Academy. Topics examined include the content of the three courses comprising the sequence and the development of the extensive laboratory program which is vital to the success of the digital curriculum.

b. Also With John R. Maneely. "Design and Implementation of Student Laboratory Network." (Research-in-Progress)

See H15c.

c. "Digital Logic Unit Replacement." (Design Project in Progress)

The Department of Electrical Engineering uses several Digital Logic Units (DLUs) in conjunction with a number of our courses. The DLUs currently in place frequently fail, causing a great deal of cadet frustration and requiring a significant amount of technician attention. These new DLUs are designed to improve reliability and hence cadet performance.

5. BURGE, Legand L., Jr., Captain and Assistant Professor

a. "Efficient Coding of the Prediction Residual." Proceeding of IEEE International Conference on Acoustics, Speech and Signal Processing, 1981, pp 640-643. (Published Proceedings)

We present our designs for an efficient method of coding the prediction residual using the technique of sub-band coding at the bit rate of 9600 b/s. In the study, the premise is that the transitional information embedded in the phoneme connections of speech is most important. We used the energy in the prediction residual to distribute the bit allocation. We then discussed the relation

between the transform coding and the sub-band coding along with a brief explanation of the Articulation Index and its use in the selection of sub-bands.

b. "A statistical Analysis of Phonemes." (Research in Progress)

The analysis of the occurrence of specific vowels, consonants, fricative and plosive phonemes is examined. A desired hypothesis is to specify the statistical significance of phonemes using a bit allocation scheme. Further, the three tier model examined in item a. will be used as an excitation function for digital speech for statistical significance.

c. "Tutorial on Digital Speech." Colorado Springs Section of the Institute of Electrical and Electronic Engineers, Colorado Springs, CO. May 1981. (Presentation)

Remarks included a history of synthetic voice coding, a discussion of the facets of the speech waveform, various coding methods for digital speech and a demonstration.

d. *Microprocessor Short Course*, Summer 1981, USAF Academy, CO. (June 1981). (Book)

Locally published book of notes in support of short course taught to Headquarters Air Force Contract Management Division, Kirtland Air Force Base, New Mexico. The course presented the microprocessor as an element of a system and emphasizes hardware techniques for integrating the basic microprocessor into the system.

6. HOBART, William C., Jr., Captain and Instructor

a. "Computer Network Optimization."
See H16b.

7. JOHNSON, Robert W., Lieutenant Colonel and Assistant Professor.

a. Associate Editor of *Systems and Software Journal*. Critiqued 35 proposed articles and assisted 8 authors in making their articles acceptable for publication.

b. Microprocessor Short Course. Air Force Contract Management Division (AFSC), USAF Academy, CO. 15-19 June 1981. (Short Course)

Both technical and management issues concerning the engineering of microprocessors into Air Force weapon systems were presented to 25 officers and civilians.

c. Also with Jim O'Rourke. "Electronics Epoch," Summer Alumni College, USAF Academy, Co. June, 1981. (Presentation)

Approximately 40 Academy graduates and their spouses attended this media session .

8. JOYCE, James J., GS-9, and Laboratory Technician

a. "Volleyball Detection System."
See H24a.

9. KALE, S., Lieutenant and Research Assistant

a. "Volleyball Detection System."
See H24a.

10. KEELER, Bonnie L., First Lieutenant and Instructor

a. "Fuzzy Probabilities and Fuzzy Events: Extensions of Probability Theory in Decision Analysis." Arizona State University, June 1980. (Thesis).

This paper extends the traditional (Bayesian Hierarchical Inference) treatment of a sample military decision problem to include approximate reasoning (Fuzzy Logic) concepts.

11. KLAYTON, Alan R., Captain and Associate Professor

a. "Microprocessors in Education at the United States Air Force Academy."
See H4a.

12. LAIRD, D. Lieutenant and Research Assistant

a. "Volleyball Detection System."
See H24a.

13. LINARES, Luis C., Captain and Assistant Professor

a. Also with S. S. Li. "An Improved Model for Analyzing Hole Mobility and Resistivity in p-Type Silicon Doped with Boron, Gallium, and Indium." *Journal of the Electrochemical Society* 128 (1), 601-608 (1981). (Article)

A theoretical and experimental analysis of mobility and resistivity in p-type silicon which includes consideration of scattering by acoustical and optical phonons, ionized and neutral impurities, interband scattering, hole-hole scattering, and the nonparabolic nature of the valence bands, over a dopant density range of 10^{14} to 10^{18} cm^{-3} and temperature range from 100 to 400K.

b. Also with J. F. Lin, S. S. Li, and K. W. Teng. "Theoretical Analysis of Hall Factor and Hall Mobility in p-Type Silicon." *Solid State Electronics*, 24(9), 827-833 (1981). (Article)

A theoretical treatment of Hall factor and Hall mobility, detailing the influence of scattering mechanisms, and nonparabolicity and anisotropy of the bands. The model covered the temperature range from 100 to 400K and a dopant density range from 10^{14} to 3×10^{18} cm^{-3}. Calculated Hall mobilities were compared with published data.

c. "Theoretical Evaluation of Conductivity and Hall Mobility in p-Type Silicon." 1982 IEEE Region 5 Conference and Exposition, Colorado Springs, CO. May 3-7, 1982. (Future Presentation)

A review of present theories concerned with conductivity and hall mobility, including the effects of band anisotropy and non-parabolicity.

14. LUHRS, Richard A., Captain and Instructor.

a. "Superintendent's Voting Machine."(Consulting)

Due to numerous difficulties with the old voting system, the redecoration of the Superintendent's Conference room has triggered a redesign of the system. The new system will be a permanently fixed wall display inside the projection booth, viewed through the screen using a backlit liquid crystal display. It will also be designed so that there will be no need to recast the vote if one member mis-votes or accidentally toggles both ways.

15. MANEELY, John T., Captain and Assistant Professor

a. "Computer Engineering Curriculum. (Research in progress)

This project consists of analyzing Air Force needs for computer engineers and developing a suitable curriculum to meet those needs.

b. "Computer Design Case Study for El Engr 380, Modern Logic Design." (Research in progress)

I am designing a small computer to demonstrate the fundamental principles of computer architecture in El Engr 380, an intermediate level digital design course. Also included is a supplement to the course text which explains the design process and design decisions in detail.

c. Also with Louis M Ayers, Jr. "Design and Implementation of Student Laboratory Network." (Research in progress)

We are designing hardware and developing software to allow a Digital LSI 11/2 to control a network of laboratory computers. The laboratory computers are used by cadets while developing and testing microprocessor applications programs.

16. MARSHALL, Veloris A., III, Captain and Instructor

a. "SEEK-TALK ADM Flight Test Support." Summer 1981 (Consulting)

SEEK-TALK is a jam-resistant voice communication system for tactical aircraft. I helped RADC (Rome Air Development Center) flight-test advanced development models of SEEK-TALK built by the Hazeltine and General Electric Corporations. The purpose of the tests was two-fold. First, the SEEK-TALK communications network was to be demonstrated in a clear environment. Second, the jam-resistance of the system was to be demonstrated. Both were accomplished in a realistic operational environment at the Eglin AFB test range using two T-39 aircraft, two ground stations and four jammer sites. I supported the tests as the SEEK-TALK Project Officer at the Central Control Facility, a ground station operator and data analyst. A quick-look data analysis was performed daily after the mission by myself and engineers from Mitre Corporation. A briefing describing this consulting and research was presented to the DFEE faculty during the DFEE faculty workshop in August 1981.

b. Also with George D. Peterson, Walter J Atkins, Jr., Donald B. Warmuth, and William C. Hobart, Jr. "Computer Network Optimization." (Research in progress)

The objective of this NORAD project is to maximize throughout on a data communication system characterized by 1,2, and 3 hop satellite communication links. The data communication system would be utilizing the new ADCCP link control procedures. Interactive data communication analysis software and a report are to be given to NORAD in 1982.

c. "Optimization of ADCCP Protocol Options for NORAD Missile Warning Display System."
See H17b.

17. PETERSON, George D., Major and Tenure Associate Professor

a. Also with C. S. Gardner. "Cross-Correlation Interference Effects in Multiaccess Optical Communications," Vol. AES-17, No. 2, March 1981. (Article)

In this paper, we investigated the effects of the cross-correlation between user codes in an optical code-division multiple-access communication system. The system model is a multiaccess satellite repeater in which the uplink and downlink channels are direct-detection, optical-polarization modulation links. The error probability is derived in terms of the cross correlation between the intended and interfering user codes. It is shown that the system error rate can be minimized by using code sequences in which the normalized second moment of the cross correlation between codes is small. The signal-to-noise ratio (SNR) on the uplink is shown to be proportional to 1/K while the SNR on the downlink is proportional to $1/K^{1/2}$, where K is the number of users which are simultaneously accessing the system.

b. Also with Royce Schultz, Scott Phillips, Walter J. Atkins, Jr., Donald B. Warmuth, and Veloris A. Marshall, III. "Optimization of ADCCP Protocol Options for NORAD Missile Warning Display System."

This consulting project with NORAD investigates the problem of specifying the appropriate options in the Advanced Data Communication Control Procedures for optimum information throughput in the NORAD missile warning display network.

c. "Computer Network Optimization."
See H16b.

18. ROSA, Albert J., Lieutenant Colonel and Tenure Associate Professor

a. Also with Joseph J. Pollard. *Signals and Systems.* USAFA, CO.: Dept of Electrical Engineering, 1981. (Text)

A functional approach to analog electrical engineering systems aimed at the non-electrical engineer. Text is used in El Engr 310, a core course.

b. "Electronic Signals and Systems: a Course for Non-Engineers." Frontiers in Education Conference Record, Rapid City, SD. October 1981. (Presentation)

This paper describes a new approach to bringing the impact of electronic technology to non-engineers.

19. SETTECERRI, Thomas J., Captain and Assistant Professor

a. "Receiver Design for Fiber Optic Bus Avionic Laboratory, Air Force Aeronautical Laboratories." (Research in progress)

The primary objective is to design and build a fiber optic receiver compatable with MIL-STD-155BB to operate at 10 Mbps. Two phases will comprise this project. Phase I (EE 499) design and Phase II (EE 464) building the best design.

20. STEWART, Clayton V., Lieutenant Colonel and Associate Professor

a. "An Introduction to Radar." Rudy Elementary School, Colorado Springs, CO. 25 February 1981. (Presentation)

I gave sixth-grade students a lecture on how radar works and what it is used for in modern society.

b. "Survey of Modern Radar Signal Processing." Pikes Peak Section of the Institute of Electrical and Electronics Engineers, Colorado Springs, CO. 12 February 1981. (Presentation)

Topics addressed included high resolution radar, pulse compression, synthetic aperture radar, and phased array antenna systems.

c. "The Use of Artificial Intelligence to Enhance Electromagnetic Combat Capabilities." To be presented at the Sixth Air University Airpower Symposium Maxwell AFB, AL. March 1982. (Forthcoming presentation)

I propose ways that artificial intelligence techniques such as pattern recognition, image processing, and multisensor correlation can be applied to such electromagnetic combat tasks as suppression of enemy air defenses; command, control, and communications countermeasures; and electronic warfare.

d. "Research at an Undergraduate, Engineering-Oriented University." To be presented at the 1982 IEEE Region 5 Conference and Exposition, Colorado Springs, CO. May 3-7, 1982. (Presentation)

21. VINES, Darrell L., Distinguished Visiting Professor

a. "A Microprocessor-based Wind Speed Controller." (Research)

I designed and fabricated a microprocessor based controller to monitor wind speed, close SCR switches to supply power to the utility company, monitor power flow and to provide a fail safe condition. Wind generator supplies 25 KW, 30, 60 Hz power during 7-25 mph winds.

22. WALSH, G., Lieutenant and Research Assistant

a. "Volleyball Detection System."
See H24a.

Major Warmuth and Captain Angell, members of the DFEE faculty, examine a cadet engineering design project

23. WARMUTH, Donald B., Major and Associate Professor

a. "An Infrared Application to the Detection of Induced Surface Currents." 25th Annual International Technical Symposium and Instrument Display of the Society of Photo-Optical Instrumentation Engineers (SPIE), San Diego, CA. 25-27 August 1981. (Presentation)

This dealt with the electronic interface between the AGA Thermovision system and the HP9845T desktop computer.

b. "Computer-aided Learning Support for EE 443." (Research in progress)

I developed software required for color graphics support of EE 443, Electromagnetics. The programs allow cadets to plot up to four propagation patterns for linear phased-array antennas.

c. "Automatic Recognition of Synthetic Speech Using an Electronic Model of the Middle and Inner Ear." International Conference on Acoustics, Speech, and Signal Processing (IEEE), forthcoming May 1982. (Paper)

The paper presents a phoneme-based automatic speech recognition system that was developed and tested using synthetic speech. The actual research was performed as a partial requirement for my PhD.

d. "Interactive Digital Communications Simulator."
See H2c.

e. "Computer Network Optimization."
See H16b.

f. "Optimization of ADCCP Protocol Options for NORAD Missile Warning Display System."
See H17b.

24. WILSON, Wayne D., Major and Assistant Professor

a. Also with James J. Joyce, G. Walsh, S. Kale, and D. Laird. "Volleyball Detection System" (Patent)

As a result of work accomplished in Engr 430 and El Engr 464/65, our group has been awarded an Air Force Scientific Invention with the Air Force seeking a patent on their Volleyball Net-Foul Detection and Inbounds/Out-of-Bounds Systems. The invention is a combination of a net-foul detection system and an inbounds/out-of-bounds detection system for use in volleyball. The net-foul detection system comprises a wire mesh antenna located on both sides of the net, an amplifier, a comparator, and a directionality circuit. The inbounds/out-of-bounds detection system includes a light source. For example, six pairs of lights for directing a light beam along the boundary lines of a volleyball court, and a receiving system having a control board and photocell receivers, each receiver facing its respective light source, and each receiver being connected to the control board. The systems determine if a player or the ball touches the net and if a player or the ball is outside the boundary lines. The systems determine if a player or the ball touches the net and if a player or the ball is outside the boundary lines. The systems also distinguish between a player and the ball.

CHAPTER I
Department of Engineering Mechanics

1. BAGLEY, Ronald L., Captain and Assistant Professor

a. "Constitutive Modeling of Dissipative Materials." (Research in progress)

This research sponsored by Air Force Wright Aeronautical Laboratories, Wright-Patterson AFB, Ohio, is in support of the F-100 engine project. The research focuses on the relationships between time-dependent stress and time-dependent strain in enamels and polymers. The goal is to determine the feasibility of reducing vibration damage in engine components using polymer or enamel coatings that absorb vibrations.

b. Also with P. J. Torvik. "Fractional Calculus—A Different Approach to the Finite Element Analysis of Viscoelastically Damped Structures." AIAA 22nd Structural Dynamics and Materials Meeting, Atlanta, GA.6 April 1981; Frank J. Seiler Research Laboratory, USAFA, CO. August 1981; Oklahoma University, Norman, OK. 16 September 1981. (Presentation)

A new approach for solving Finite Element equations with the presence of non-viscous damping.

2. CARTER, Dale K., Captain and Assistant Professor

a. Also with Paul D. Copp, George K. Haritos, Thomas E. Kullgren, David J. Morrison, Michael C. Mushala, John B. Sulivan and George W. Watt. "Fatigue Crack Growth in Engine Materials." (Research in progress)

This project is an investigation of fatigue crack growth under high temperature, low cycle fatigue conditions in support of the AFWAL/ML program on life prediction in turbine engine materials. Increased performance requirements for USAF gas turbine engines result in the engine components being subjected to high operating stresses in severely high temperature environments. Very conservative design has resulted in the replacement of turbine disks at specified intervals though the disks may not have critically-sized flaws. This procedure is very costly and new design concepts such as Retirement-For-Cause are being studied to reduce the incidence of premature retirement. We've aimed this project at developing theoretical and experimental tools required to implement this new concept. We have initially concentrated on characterizing surface-flaw propagation in an aluminum alloy at room temperature, and we are currently writing a technical report on this effort. We then intend to characterize flaw growth in a titanium alloy under engine conditions.

3. COPP, Paul D., Captain and Associate Professor

a. "Fatigue Crack Growth in Engine Materials."
See 12a.

4. FINLEY, Thomas C., Major and Assistant Professor

a. "USAF Academy Wind Site Survey; Methodologies for Use by the Air Force."
See 110c.

5. FISHER, Cary A., Colonel, Professor and Head

a. "Mechanics and Materials for the Masses—A Unique Course Concept." American Society of Engineering Education National Meeting, Los Angeles, CA. 22-25 June 1981.

I described the course distinctives of Mechanics 210—a blend of elementary strength of materials with introductory materials science.

Captain D.K. Carter, DFEM, sets up the hydraulic loading apparatus used to investigate fatigue crack growth in turbine engine materials

6. HAGER, Joseph W., Captain and Instructor

a. "An AC Signal Analysis Approach to the Characterization of Corroding Metal Electrodes." (Dissertation research)

This research in cooperation with the Solar Energy Research Institute and the University of Florida, examines the utility of a computer-controlled signal analysis routine in determining the impedance of corroding metal electrodes. The electrochemical interface is perturbed with a small amplitude random noise signal. Perturbing voltage and current response are then converted to the frequency domain via the Fast Fourier Transform (FFT) and combined to yield electrode impedance. The resultant arrays of impedance data may be analyzed to evaluate resistive and capacitive components of a three element equivalent circuit model.

7. HANSEN, James G. R., Major and Assistant Professor

a. Also with R. M. Richard and R. R. Shannon. "Deformable Primary Mirror for a Space Telescope." *Applied Optics*, submitted. (Article)

We designed a 4-m-aperture deformable primary mirror with supports integrated into a single structure. The integrated active mirror's minimal weight makes it desirable for a space telescope as well as a terrestrial application. Utilizing displacement actuators instead of force actuators, the active controls at the mirror's surface include normal position control and slope control in both the radial and tangential directions at each of 40 control points. Influence functions for each of the controls are nearly independent, reducing the complexity of the control system. Experiments with breadboard models verify the structural concept and the techniques used in the finite element method of computer structural analysis. This article describes the results of finite element analyses.

b. "Structural Design of a Large Deformable Primary Mirror For a Space Telescope." Diss. Univ. of Arizona 1981. (Dissertation)

See 17a.

8. HARITOS, George K., Captain and Associate Professor

a. Also with L. M. Keer. "Loss of Adhesion for an Embedded Block." (Research in progress)

The aim of this project, sponsored by Frank J. Seiler Research Laboratory, is to gain a better understanding of adhesive failure in bonded inserts. In the limiting case, if the thickness of the insert is negligible when compared to its length, the problem becomes one of examining adhesive separation of fibers embedded in a matrix, such as in fiber reinforced composite materials. This mixed boundary value problem in two-dimensional elasticity will be solved by establishing a Green's function, and then using numerical techniques to solve the resulting integral equations.

b. Also with M. D. Bryant and L. M. Keer. "Subsurface Cracking and Delamination." *Solid Contact and Lubrication*, American Society of Mechanical Engineers, AMD-Vol. 39, 79-95, 1980. (Article)

Numerical results are presented for a cracked elasticryant and L. M. Keer. "Subsurface Cracking and Delamination." *Solid Contact and Lubrication*, American Society of Mechanical Engineers, AMD-Vol. 39, 79-95, 1980. (Article)

Numerical results ar mechanisms for crack propagation are introduced.

c. Also with M. D. Bryant and L. M. Keer. "Subsurface Cracking and Delamination." 101st American Society of Mechanical Engineers Winter Annual Meeting, Chicago, IL. 16-21 November 1981. (Presentation)

We discussed the results of I8b.

d. Also with M. D. Bryant and L. M. Keer. "Subsurface and Surface Cracking Due to Hertzian Contact." *American Society of Mechanical Engineers Journal of Lubrication Technology*, submitted. (Article)
See I8b.

e. "Fatique Crack Growth in Engine Materials."
See I2a.

9. HEMING, Francis S. Jr., Captain and Associate Professor

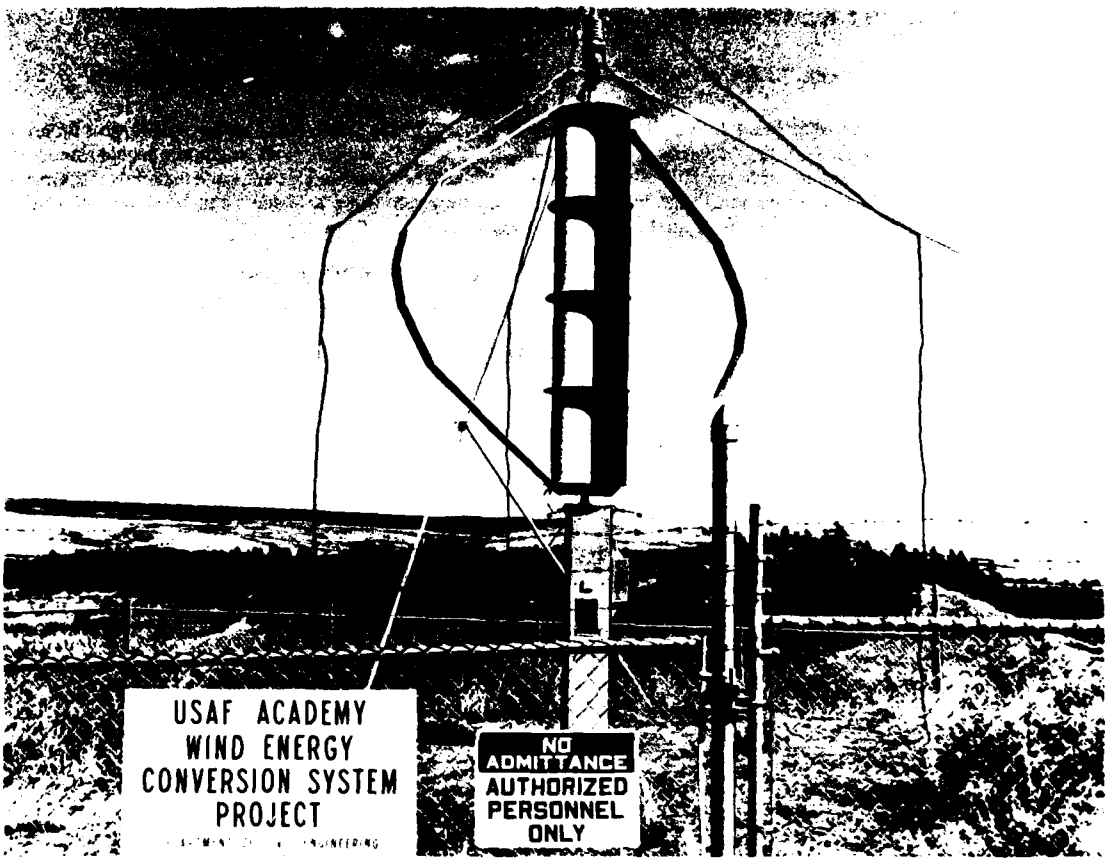
a. Also with H. D. Bartel, Richard M. Hanes and Bill J. Simmons. "An Investigation of the Dynamic Response of a Seismically Stable Platform (Platform Dynamic Response)." (Research in progress)

Sponsored jointly by Frank J. Seiler Research Laboratory and Central Inertial Guidance Test Facility, Holloman, AFB, NM. There is presently a requirement for a more stable test platform for advanced guidance systems. In support of the overall effort underway, this project addresses three specific areas: experimental dynamic testing, theoretical analysis and verification, and design guidance and consultation. The objective of the experimental testing is to determine the natural frequencies and mode shapes of the isolation test pad (Iso-pad) located in the USAFA Guidance and Control Laboratory. A state-of-the-art modal extraction software package called *MODAL-PLUS* provides this capability. We will verify a theoretical model of the Iso-pad via a NASTRAN finite element analysis using the experimental results. We can then use the NASTRAN model to determine the effects of design changes. The information and experience gained through this procedure can be used to provide design guidance and consultation on the next generation of the test pad. Consultation has been provided on a prototype design submitted to Holloman by the prime contractor. Modal analyses of the USAFA Iso-pad and the prototype platform at Holloman have been completed. NASTRAN analyses of the USAFA Iso-pad are in progress.

b. Also with R. M. Hanes and B. J. Simmons. "Dynamic Analyses of Test Platform." AIAA Guidance and Control Conference in Albuquerque, NM. 19-21 August 1981. (Presentation)
See F7b.

10. KULLGREN, Thomas E., Lieutenant Colonel and Tenure Associate Professor

a. Also with Joel Benson, George Kehias, Ralph Rhye and Dennis Wiedemeier. "Wind Turbine Siting Applications." (Research in progress)



Wing energy conversion project

This project, sponsored by the Air Force Engineering and Services Center, Tyndall AFB, FL, continues with planned wind site surveys of four USAF bases and subsequent technology transfer to the major air command level. In addition, a 30-meter tower and associated wind instrumentation will be used to investigate wind speed-up over ridgelines.

b. Also with Dennis W. Wiedemeier. "United States Air Force Academy (USAFA) Vertical Axis Wind Turbine." Final Technical Report, ESL-TR-80-48, Air Force Engineering and Services Center, September 1980. (Technical Report)

This report describes the design, fabrication, installation, and testing of a small variable-speed vertical axis wind turbine. This device is unique in its installation, unconventional and simple support system and variable-speed operation under microprocessor control.

c. Also with Steven C. Boyce and Thomas C. Finley. "USAF Academy Wind Site Survey; Methodologies for Use by the Air Force." Final Technical Report, ESL-TR-81-02, Air Force Engineering and Services Center, December 1980. (Technical Report)

This report describes a wind site survey to locate potential high energy sites at the USAF Academy for future wind machine installation. Three wind site survey methodologies for surveying other bases are also presented.

d. Also with Gary W. Worley. "Getting Hooked on Wind Power." *Engineering and Services Quarterly*, November 1980. (Article)

We discuss general characteristics of a wind site survey of an Air Force base using the experience at the USAF Academy as an example.

e. "Wind Site Survey Methodologies for U.S. Air Force Installations." Wind Energy Technoloy Conference, Kansas City, MO. 16 March, 1981. (Presentation and Article published in the conference proceedings.)

Three methodologies are presented for conducting organized wind site surveys of Air Force installations.

f. "The Air Force Wind Program." Solar Energy Research Institute, Golden, CO. August 1981. (Presentation)

Results of the Air Force wind site survey program were discussed and future plans presented.

g. Also with George A. Kehias. "Wind Site Survey of Ellsworth AFB." Ellsworth AFB, SD. September 1981. (Presentation)

We completed a wind site survey of Ellsworth AFB and presented results to the base civil engineers. Conclusions included comments on the wind resource and the economics of wind energy.

h. "Fatigue Crack Growth in Engine Materials."
See 12a.

11. MORRISON, David J., Captain and Assistant Professor

a. "Fatigue Crack Growth in Engine Materials."
See 12a.

12. MUSHALA, Michael C., Major and Associate Professor

a. "Fatigue Crack Growth in Engine Materials."
See 12a.

13. SULLIVAN, John B., Captain and Assistant Professor

a. "Fatigue Crack Growth in Engine Materials."
See 12a.

14. WATT, George C., Lieutenant Colonel and Associate Professor

a. "Fatigue Crack Growth in Engine Materials."
See 12a.

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CHAPTER J
Department of English

1. AUBREY, James E., Major and Associate Professor

a. "Alexander Pope and 'Picturesque' Landscape." *Bucknell Review*. (Forthcoming article)

Although Pope influenced the eighteenth century landscape gardening movement, he used the work *picturesque* in the older sense of "graphically vivid" as well as in the more fashionable sense applied to landscapes that please the eye.

b. "Pope, Johnson, and Timon's Villa." Johnson/Boswell Society Meeting at USAFA, CO. 15 April 1981. (Presentation)

c. Rev. of *Bring Me Men and Women: Mandated Change at the USAF Academy*, by Judith H. Stiehm. *Air University Review*. (Forthcoming)

d. "The Role of the Tarot in John Fowles' *The Magus*." Second International Conference on Fantasy, Boca Raton, FL. 20 March 1981. (Presentation)

The novel's broken pattern of allusions to tarot cards mimics the inadequacy of such systems for explaining man's place in the cosmos. In *The Magus*, Fowles invites both the narrator and the reader to become like magicians who manipulate such illusion, instead of being deceived by false perceptions of order.

2. BECK, Charles E., Major and Assistant Professor

a. "Effective Writing." National College of Business, Colorado Springs, CO. 24 March 1981. (Presentation)

b. "The Impact of the Urban Observatory on the University." Diss. University of Denver. Expected completion, Spring 1982. (Dissertation)

In the early '70s, HUD sponsored an "Urban Observatory" in ten cities to serve as a research coordinator through which city managers could obtain needed research using the local universities. Previous evaluations concerned how the Observatories affected the cities involved; this dissertation research examines impact on curriculum and instruction at the participating universities, and determines institutional factors within the universities which fostered such impact.

c. "Implications of Neuro-Linguistic Programming in the Classroom. (Research in Progress)

This new development of Psycholinguistics identifies three ways in which people represent their world and the language they use to receive input as well as interact. Individual tendencies toward visual, aural, or kinesthetic cues either permits or blocks effective communication. Highly effective in counseling and therapy, this model of communication likewise has implications for classroom teachers.

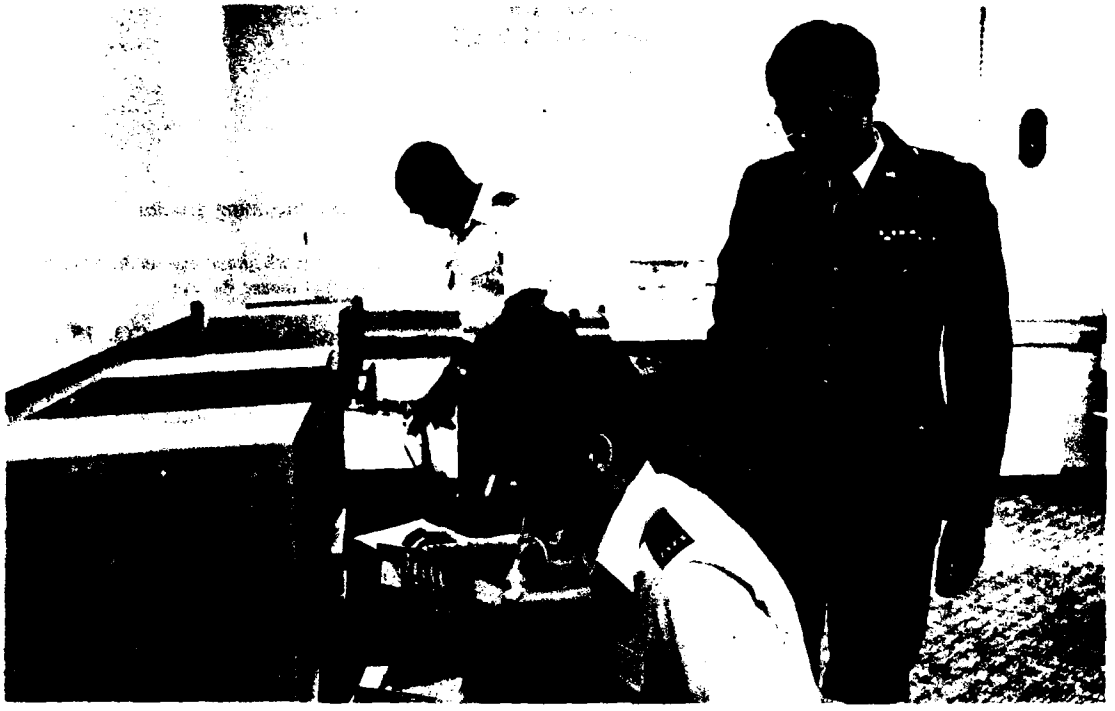
d. "Iran's History and Culture as a Background to the Hostage Crisis." VFW Post 101, Colorado Springs, CO. 25 November 1980. (Presentation)

e. Writing Consultant for Region Eight of the Federal Emergency Management Agency, Denver, CO.

I conducted three Effective Writing Workshops (fall 1980 and spring 1981) for state and county emergency coordinators from eight states in the Rocky Mountain Region. (This rather new federal agency replaced the former Disaster Preparedness Agency.)

f. "Workshop in Use of Visuals," in *Courses, Components, and Exercises in Technical Communication*. Ed. Dwight Stevenson. NCTE No. 08776R. Urbana, Il: National Council of Teachers of English, 1981. (Article)

g. "Technical Illustration."
See J21k.



Major Hugh Burns investigates Computer-Assisted Instruction for the Department of English

3. BURNS, Hugh L. Jr., Major and Associate Professor

a. "A Writer's Tool: Computing as a Mode of Inventing." New York College English Association Conference, Saratoga Springs, NY. 4 October 1980. (Presentation)

b. "Stimulating Thinking with Computer Technology." *Proceedings of the Task Force on Technology in Education*. Colorado Commission on Higher Education, Colorado Springs, CO. March 1981. (Presentation)

c. "Stimulating Thinking with Computer Technology." Task Force on Technology in Education, Colorado Commission on Higher Education, United States Air Force Academy, CO. 16 March 1981. (Presentation)

d. "Computer-Assisted Instruction: Values for the 1980s." Conference on College Composition and Communication, Dallas, TX. 27 March 1981. (Recorder)

e. "Pandora's Chip: Concerns about Quality CAI." *Pipeline*, Fall 1981, 15-16. (Article)

4. GASTON, James C., Lieutenant Colonel and Tenure Associate Professor

a. "The Air Force Poetry of John Ciardi." USAF Academy, CO, June 1981. (Research in Progress)

A study, eventually to become a videotape, which examines the poetic responses of John Ciardi to his Air Force experiences in World War II.

b. "James Gould Cozzens in the Air Force." USAF Academy, CO, Estimated completion, Summer 1981. (Research in progress)

James Gould Cozzens served as a staff officer at the highest level in the Air Force from 1943-1945. He kept a thorough diary during those years, recording his responses to Air Force leaders such as Generals Arnold, Eaker, LeMay, and Kuter. He also kept copies of letters, speeches, and memos prepared for General Arnold. Cozzens used these materials later in the writing of his Pulitzer Prize winning Novel, *Guard of Honor*. This study will examine the importance of Cozzens' Air Force experiences to his work as a novelist.

c. "Pilgrimage: James Dickey at the Air Force Academy." American Studies Conference, Wichita, KS. 7 November 1981. (Presentation)

A 25-minute multi-image program examining the meaning of Air Force experiences in the poetry of James Dickey.

5. GRIMSHAW, James A., Jr., Lieutenant Colonel and Tenure Professor

a. "Anatomy of a Story." By Dr. Charles Clerc. USAF Academy, CO.: DFSEA/DFENG, 1981. (Video Tape, 51 mins)

I narrate portions of Eudora Welty's short story, "Where Is the Voice Coming From?", which Dr. Clerc uses to illustrate various critical methods of interpretaion.

b. Colorado Springs *Sun* book reviews of: *Being Here*, by Warren (30 Nov 80), p. 4-C; *The Second Handshake*, by Fowler (14 Dec 80), p. 15-E; *Football Dreams*, by Guy (28 Dec 80), p. 10-C; *Lord of Misrule*, by Jones (15 Mar 81), p. 4-C; *The Collector's Cabinet*, by Berges (5 Apr 81), p. 7-C; *The Brazen Face of History*, by Simpson (12 Apr 81), p. 12-C; *Faces in My Time*, by Powell (19 Apr 81), p. 6-C; *Meeting Rossy Halfway*, by Leavitt (3 May 81), p. 6-D; *How to Make Your Car Last a Lifetime*, by Fendell (17 May 81), p. 7-C; *Headlong*, by Williams (21 Jun 81), p. 7-C; *Zuckerman Unbound*, by Roth (28 Jun 81), p. 7-0B; *Hemingway: Selected Letters*, by Baker (5 Jul 81), p. 7-D; *Playboy Interview*, by Golson (12 Jul 81), p. 6-B; *Masters: Portraits of Great Teachers*, by Epstein (19 Jul 81), p. 8-B; *Maritime Antiques*, by Major (26 Jul 81), p. 6-C; *Solomon's Daughter*, by Poverman (20 Sep 81), p. 4-D; *Everything We Had*, by Santoli (18 Oct 81), p. 3-B.

c. *Encyclopedia USA*. Ed. R. Alton Lee. Gulf Breeze, FL: Academic International Press, forthcoming. (Bio-sketches)

"Flannery O'Connor" and "Robert Penn Warren" are my contributions to this 50-volume "open-ended work of information that organizes existing and accumulating knowledge about the American experience into alphabetical form and a standard format."

d. "English Experienced." Advanced Placement Workshop, Air Academy High School, CO. 22 April 1981. (Presentation)

This meeting with Colorado high school teachers of Advanced Placement (AP) English courses involved my experiences as a reader of AP English essays, evaluations of AP students' preparation for the national ETS examination, and suggestions for ways AP teachers might improve their students' preparedness.

e. "The English Renaissance." Rocky Mountain Medieval & Renaissance Association, USAF Academy, CO. 11 April 1981. (Presentation)

Speaking on the panel which I moderated were Dr. Jeanie R. Brink, Arizona State University; Dr. Patricia Demers, University of Alberta, Canada; and Major Robert S. Staley, USAF Academy, CO.

f. "Hidden Persuasions in Technical Writing." The First Southwest Regional Conference of the National Council of Teachers of English, Las Vegas, NV. 16-18 Oct 80. (Presentation); published in *The Technical Writing Teacher*, (Spring 1981). (Article)

Starting with the premise that technical communications are *not* objective, but are honest in their subjectivity, this presentation and subsequent article concentrate on the definition of technical writing and the persuasive methods used in such writing.

g. "Makeweight or Misadventure: U.S. Conventional Arms Transfers in the Middle East." DFENG, DFH, and DFPS: National Defense Colloquium, USAF Academy, CO. 10 December 1980. (Presentation)

I served as moderator at this colloquium.

h. Modern Humanities Research Association *Annual Bibliography*. Ed. Michael Smith. Vol. 55. Leeds, England: MHRA, 1980. (Bibliography)

As contributor, I catalog pertinent articles on English and American language and literature from twenty-three assigned journals.

i. Rev. of *Sinclair Lewis: A Reference Guide*. *Rocky Mountain Review of Language and Literature*, 35 (1981), 310-11. (Book review)

Reviewing Robert E. Fleming's reference guide in light of three important elements of bibliography—accuracy, completeness, and timeliness—I conclude that *Sinclair Lewis* is a useful enumerative bibliography.

j. "Robert Penn Warren; or, the Case of the Upright Classic." Colorado Seminars in Literature, Colorado College, Colorado Springs, CO. 25 April 1981. (Presentation)

Based on an accepted definition of *classic*, Robert Penn Warren's *All the King's Men*—as well as his other diverse works—should qualify Warren as a "contemporary classic in English."

k. "Some Observation on Robert Penn Warren's Bibliography." Robert Penn Warren's 75th Birthday Symposium, University of Kentury, Lexington, KY. 29-30 October 1980. Presentation, published in *The Kentucky Review*, 2, no. 3 (1981), 19-30 (Article)

Reminiscences and anecdotes associated with the twelve-year compilation of *Robert Penn Warren: A Descriptive Bibliography* and focused on my association with the Warrens.

l. "Spring Break." *George Review*, forthcoming. (Poem)

m. "Supreme Fiction: Robert Penn Warren at 75." *Southern Review*, NS 17 (Spring 1981), 444-49. (Book review)

Essay-review of the following books: *Being Here: Poetry 1977-1980*, by Warren; *Robert Penn Warren Talking*, by Watkins and Hiers; *Robert Penn Warren: A Vision Earned*, by Walker; and *Robert Penn Warren: A Collection of Critical Essays*, by Gray.

n. "What Literature Can Teach Us About Leadership." In *Literature in the Education of the Military Professional*.. Ed. Lt Col. Donald Ahern and Cdr Robert Shenk. USAFA: DFENG, forthcoming. (Article)

From ten qualities of a leader, I show how "good" literature helps define, illustrate, and reinforce the attributes necessary in a leader.

6. KEATING, Thomas M., Captain and Instructor

a. "Anti-Catholic Sentiment in Book I of Paradise Lost." Rocky Mountain Medieval & Renaissance Association, USAFA, CO. 10 April 1981. (Presentation).

7. KEMPF, James M., Captain and Instructor

a. Edited *USAFA Aeronautics Digest*, Fall/Winter 1980, released Summer 1981. (Edited work)

b. Edited Vol. II No. 1 of *USAF Academy Journal of Professional Military Ethics*, Sept 1981. (Edited work)

c. *Exiles and Establishmentarians: A Biographical Study of Malcom Cowley.* Diss. Northwestern University, July 1981. (Published Dissertation)

A biographical study of the development of Cowley's thought in relation to twentieth-century literature and intellectual history.

d. "Reflections of an English Major on the Technical Society." *USAFA Aeronautics Digest,* Fall 1981. (Article)

e. Rev. of *On Every Front: The Origins of the Cold War 1945-50,* by Thomas R. Patterson. *Naval War College Review,* forthcoming. (Review)

8. LINZY, Nancy A., Captain and Instructor

a. "Criticism of Tobias Smollett's Novels from 1748 to 1824." Diss. Tulane University, LA. 1982. (Dissertation)

A compilation of published criticism, letters, and conversations on Smollet's novels from 1748 to 1824 with a brief introduction assessing his reputation as a novelist and influence and contribution to the novel based on this compilation.

9. LUCKETT, Perry D., Major and Associate Professor

a. "American Literature Studies for the Military Officer." In *Literature in the Education of the Military Professional.* Ed. Lt Col Donald Ahern and Cmdr Robert Shenk. USAFA: DFENG, forthcoming 1982. (Article)

Argues the need for military offices to study American literature as a record of the heritage they are sworn to defend.

b. *Charles Lindbergh: A Bio-Bibliography.* Westport, CT: Greenwood Press, forthcoming, 1982. (Research in Progress-Book)

A study of Lindbergh's place in American culture, together with a bibliographical essay and an exhaustive check[illegible].naterials by and about him.

c. "Maxwell Anderson." *Encyclopedia USA. Ed. R.* Alton Lee. Gulf Breeze, FL:Academic International Press, forthcoming 1981. (Note)

A biographical and critical note on Anderson and his most significant plays. Includes bibliography of best book-length criticism on Anderson.

d. "Maxwell Anderson's Skepticism: Essay, Poems, and Political Plays." 1981. (Article Submitted for Publication)

Relates skeptical thought in Anderson's early poetry and essays to his changing political views in dramas from 1920 to 1950.

e. "On Business Communications." To the Department of Communications, University of Colorado at Colorado Springs. 15 April 1981. (Presentation)

Practical applications of clear, concise writing and speaking to industrial reports and briefings, business correspondence, and resumes.

f. "Sherwood Anderson." *Encyclopedia USA.* Gulf Breeze, Florida: Academic International Press, forthcoming 1981. (Note)

Reviews *Winesburg, Ohio* and other collections of short stories, as well as several of Anderson's novels and autobiographical writings. Includes annotated bibliography of secondary sources and brief biography.

g. "Werewolves and Vampires in Literature and Film." USAF Academy faculty and staff, USAF Academy, CO. 2 September 1981. (Faculty Seminar Presentation)

Lecture, supported by slides and illustrations, on the folkloric, anthropologic, psychoanalytic, and literary origins of vampires and werewolves in the 20th Century. Also considered the filmography of these two legendary figures to demonstrate that the vampire has been a more compelling inspiration for modern authors.

Lt Col William McCarron compiles a bibliography spanning the last twenty years of criticism on metaphysical poetry for the Trinity University Press checklist in the Humanities Series.

10. McCARRON, William E., Lieutenant Colonel and Tenure Professor

a. "Eight Controversial Prepositions for the Teaching of Writing." (Article intended for publication in early 1982)

Highlights theory and application of a new approach to writing being taught in Freshman English at USAF Academy.

b. "English 111Y at USAF Academy." (Research in progress)

A semester-long research project sponsored by NEH/Iowa Institute on Writing. A case-study approach which involves sections taught by Capt Waller, Capt Keating, and Lt Col McCarron.

c. "Hidden Persuasion in Technical Writing."

See J5f.

d. "Oral Briefing vs. the Technical Report: Two Approaches to Communications Problems." *Courses, Components, and Exercises in Technical Communication.* Ed. Dwight W. Stevenson. Urbana, Ill.: National Council of Teachers of English, 1981, pp. 144-156. (Article)

Explores how technical briefing differs from a report in the following areas: audience analysis, graphics, feedback, and *ethos*.

e. "Research on the Composing Processes of Skilled and Unskilled Writers." Conference on College Composition and Communication, Dallas, TX. 17 March 1981. (Presentation)

Arranged for and chaired a panel for three speakers who talked on their research with basic writers at University of Southern California, University of Texas at Austin, and Central College (Iowa).

f. "The Selling of College Writing Textbooks." *ADE Bulletin,* 1981. (Article accepted for publication in early 1982.)

A short article on the salesmanship of college textbooks.

g. "Tough Talk on Directing a Freshman Writing Program." Wyoming Conference on Freshman and Sophomore English. 8 July 1981. (Presentation)

The underlying thrust of a freshman writing program ought to be the writing the students do, not a textbook about writing.

h. "Tourist War: Notes on Vietnam." Cleared by Hq USAF. (Manuscript)

A series of 12 essays and 5 stories on aspects of the Vietnam war. Manuscript is 210 pages in length. Two essays have been accepted for publication: "At a Revetment in Viet[illegible]" will appear in *Buffalo* magazine, and "On Machiavelli and Vietnam" will appear in *USAFA Journal of Professional Military Ethics.*

11. McKELVY, Rayolyn L., *Captain and Instructor*

a. "Effective Communication." Civil Air Patrol Summer College. USAF Academy, CO. June 1981. (Presentation)

Defined the communication model and the role it plays in CAP activities. Emphasized ways to improve communication in CAP.

b. "Effective Listening." Address to the Armed Forces Staff College, Norfolk, VA. 7 February. 1981. (Presentation)

A review of the listening process, where we often fall short and how to improve our listening skills and habits. (Also led a workshop with 15 people about specific listening problems within the military).

c. "Effective Listening." Address to the Armed Forces Staff College, Norfolk, VA. August. 1981. (Presentation.)

Review of listening problems, bad habits and other shortcomings. How to be a more effective listener and the benefits of effective listening in management situations.

d. "The need for Effective Listening in the Air Force." *Air University Review.* (Article)

A defense of teaching listening to Air Force officers, NCO's, and other managers.

e. "Organizing to Speak." Civil Air Patrol Summer College, USAF Academy, CO. June 1981. (Presentation)

A practical workshop on clear thinking and speech preparation.

f. "State of the Art in Teaching Listening." Department of English Faculty Seminar, USAFA, CO. April 1981. (Presentation)

g. "Teaching Listening at USAFA." July 1981. (Research in progress)

Proposal to DF to include a skills course for all freshmen.

h. "Teaching Memory." Address to How-to-Study Counselors, English Dept., USAFA, CO. 21 September 1981. (Presentation)

A review of techniques by Robert Montgomery, Jerry Lucas, and Harry Lorraine on teaching memory devices to cadets in the How-to-Study program.

i. "Technology in Teaching Listening." Address to the University of Southern Colorado Faculty Seminar, Pueblo, CO. April 1982. (Presentation)

Demonstration of variable-speed tape recorder and review of techniques for teaching better listening skills at the college level.

j. "Who's Doing What in Teaching in the Armed Forces." March 1982. Paper for 1982 International Listening Association Convention. (Research in progress)

A review of all listening courses in the Army, Navy, Marines, Coast Guard, Air Force, training schools, Non-commissioned officer courses, officer training programs, and professional development classes.

k. Workshop Director and Program Coordinator for the 2nd International Listening Association meeting in Denver, CO. March 1981. (Workshop)

12. MILLER, Doris, Captain and Instructor

a. "The Learned Pig Redressed: Some Female Characters in 18th Century Comedy." SCSECS. South Central Society for Eighteenth-Century Studies, University of Texas, Austin, TX. 6 March 1981. (Presentation)

13. MOORE, Victoria A., Captain and Instructor

a. "Progression in 'L' Allegro' and 'Il Penseroso' " Rocky Mountain Medieval & Renaissance Association, USAFA, CO. 10 April 1981. (Presentation)

14. O'ROURKE, James S. IV, Major and Associate Professor

a. "The Distinction Between Education and Training: The Need for a Balance in the Preparation of Military Officers." (Research in progress)

Educational philosopher John Dewey, among others, has drawn a distinction between education and training. For those of us who prepare young men and women for military careers, this distinction, and its implications for the development of professional judgement, is by no means trivial. A careful balance between the two is—or should be—carefully maintained in the pre-commissioning process.

b. "Effective Writing: It's More Than Simply P's and Q's." Rocky Mountain Association of Medical Transcriptionists, Colorado Springs, CO. 6 May 1981. (Presentation)

Effective writing, particularly when you're working with material originally devised by another person, is more a matter of clarity and style than it is simple grammar and punctuation.

c. "The Irrational Astronomers." *The Air University Review*, XXXII, no. 1 (Nov-Dec 1980), 115-117. (Article)

An examination of the philosophical bridge between astrophysics and metaphysics: the implications of our expanding cosmos and why certain scientists continue to ignore their own evidence.

d. "A Little Plain Talk About Television: Are You Sure It's What You're Looking For?" *The International Journal of Instructional Media*. 8, No. 3 (1981), 213-220. (Article)

A substantial amount of research into learning from television has shown that the medium has a measurable impact on the cognitive, affective, and behavioral processes of the learners involved. Before an educator reaches for television as the solution to a particular problem, however, he must ask whether another instructional strategy might do the same task at a lower cost, or whether another medium might provide greater results at the same cost.

e. *The Notre Dame I Remember*, October 1981. (Research in progress)

Reminiscences of life at Notre Dame by twenty-four distinguished Notre Dame people, 1920-1980. Pen-and-Ink illustrations.

f. "Publish or Perish! In the Scholarly Press These Days, the Latter Seems to be Getting Easier." *Educational Technology*, XXI, no. 5 (May 1981), 40-42. (Article)

In the leisurely world of scholarly journals, it may well be months or even years before an author can see his or her work in print. This article examines the problem of publication backlogs, overworked publication staffs, and editors who don't take their work seriously. Recommendations are made to reduce the waiting time from acceptance to publication and to encourage young scholars to write for publication.

g. Rev. of *Teaching Television: How to Use TV to Your Child's Advantage*, by Dorothy G. Singer, Jerome L. Singer, and Diana M. Zuckerman. *The Journal of Broadcasting*. XXV, no. 3 (Summer 1981), 315-317. (Review)

Review of an important new book dealing with the impact of television on the social and intellectual perceptions of children. To be included in a special edition of *The Journal of Broadcasting* centered on the topic of broadcasting and children.

h. Rev. of *2081: A hopeful View of the Human Future*, by Gerard K. O'Neill. *Air University Review*, forthcoming. (Review)

Princeton physicist and futurist looks at technological, social, and political developments likely to affect the future of mankind within the next one hundred years. As the title implies, O'Neill is hopeful about prospects for successful resolution of contemporary problems.

i. "Those Hallowed Halls of Ivy: A Quick Look Back at Life as an Undergrad." *Notre Dame Magazine*, forthcoming. (Article)

A light-hearted, nostalgic piece about undergraduate life at the University of Novre Dame during the 1960s.

j. "Is Television in Color Educationally Justifiable? A Review of the Research." *International Journal of Instructional Media*, Vol 9, no. 3, 1982, pp. 239-247. (Article)

15. SHENK, Robert E., Commander (USN) and Associate Professor

a. Chairman of "Medieval Drama" session, Rocky Mountain Medieval and Renaissance Association Convention, USAF Academy, CO, Spring 1981.

b. "The Classics, the Military, and the Missing Modern Element," for *Literature in the Education of the Military Professional*, USAF Academy, CO. DFENG, 1981. (Research in progress)

Argues that reading the classics would remind military leaders that essentially *men*—rather than machines—win battles and wars.

c. Rev. of *Hit First, Hit Hard: HMS Renown, 1916-1948*, by Peter C. Smith. *Naval War College Review*. (Review)

d. "Richard McKenna's *Sand Pebbles* and the 'Poetry of Machinery.' " *Critique: Studies in Modern Fiction*, forthcoming. (Article)

Seldom has the potential vitality of the engineering profession been portrayed with more sensitivity than in this novel of an ex-naval machinist's mate.

e. "Robert Frost and the Early Puritan Idea of Vocation." *Christian Scholar's Review*, forthcoming. (Article)

The idea of "vocation" or "calling" is very strong in Frost's poetry, and this idea originated with the early puritans of England and New England.

f. "Teaching English in Uniform." *ADE Bulletin*, forthcoming. (Article)

Teaching English in uniform has some distinct advantages when compared to teaching English at a civilian institution. The all-military faculty and connection with a very specific profession are the chief distinguishing traits of the Academy's English program.

16. SHUTTLEWORTH, Jack M., Colonel and Professor and Head

a. "The Influence of the Herberts on John Donne." 1983. (Research in progress)

b. "Strategies and Tactics: the Czar of Words in the 80's," Association of Departments of English, Los Angeles, CA. July 1981. (Presentation)

Discussed theoretical and practical solutions to problems of staff and technology for departments of English; recommended development of comprehensive department and leadership programs.

c. *Writing Research Papers*. New York: Holt, Rinehart, Winston. 1981. (Book)

A textbook to guide students in all academic disciplines through the research-writing process. Done in conjunction with E.P. Bailey and P.A. Powell.

d. "How to Grade Student Papers."
See J21c.

17. STALEY, Robert S., II, Major and Associate Professor

a. "The American Dream Through American Literature," Alumni College Seminar, USAFA, CO. 14 July 1981. (Presentation)

American novels and poetry reflect a changing American dream, from the expansive optimism of Cooper and Whitman, through the cautious pessimism of Dreiser and Hemingway, to the exuberant nihilism of Ginsberg and Pynchon.

b. "Consequences of Scientific Change: Seven Major Scientific Revolutions." Rhodes Seminar Series, USAFA, CO. 7 April 1981. (Presentation)

From the Columbian to the Einsteinian, great shifts in current scientific paradigms have resulted in major revisions to contemporary world-views. These revisions have often resulted in concrete political, religious, and technological developments.

c. Also with Dave Evans. "Creating a Course on Physics and Literature." 1981. (Course)

This paper details our experiences in constructing and teaching a new interdisciplinary honors course growing out of English 406H and Physics 411H. Our course goals are threefold: understand how values are reflected in literature; understand the theory and practice of modern physics; and underatand how literature and physics—or more broadly, art and science—are connected. We ask how ethical and aesthetic values operate in the scientific method and in the lives of our scientists; and conversely, we show how fact, how theory—how the physical sciences—affect art, how they play a central role in the great literature of our culture.

d. "Cross-Cultural Views of Death in Literature and Myth." Seminar on Death and Dying, Colorado Springs, CO. 19 January 1981. (Presentation)

Death has not always been feared and avoided, and a survey of various cultural attitudes on death reflected in myth demonstrates alternative and archetypal patterns.

e. *Daedalus*. USAFA, CO 1981. (Edited work)

f. "The Early 'Rebel Muse': Swift's 'Athenian Ode' as Satiric Precursor to *A Tale of a Tub*." *Eighteenth Century Studies* 1981. (Article Submitted for Publication)

Swift's early odes are generally seen as serious but failed attempts to imitate Cowley's Pindaric odes. A close reading of Swift's Athenian ode and its introductory epistle, however, uncovers evidence that the ironic genius and anti-pedantic theme central, which seem to have burst out unanticipated in *A Tale of Tub*, were already operative in his first published poetry.

g. "Honor in Literature and Life," Rhodes Seminar Series, USAFA, CO, 22 September 1981. (Presentation)

Demonstration of the applicability of honor and ethics in life—both fictional and real.

h. "Literature, Science, and the Imagination." in *Literature in the Education of the Military Professional*. Ed. Lt Col Donald Ahern and Commander Shenk. U.S. Air Force Academy: DFENG, 1981.

Both literature and science depend upon the human imagination for important innovations; thus I call on military educators to develop their students' imagination.

i. Manager for the Johnson/Boswell Society Meeting at U.S. Air Force Academy, CO, 15 April 1981.

j. Modern Humanities Research Association *Annual Bibliography*. Ed. Michael Smith. Vol. 55. Leeds, England: MHRA, 1980. (Bibliography)

Contributor. Catalog pertinent articles on English and American language and literature from ten assigned journals.

k. "The New Science in The New Classics: Pynchon, Barth, and Coover." Colorado Seminars in Literature/University of Colorado at Colorado Springs, CO. 25 April 1981.

Pynchon, Barth, and Coover follow an age-old tradition wherein the finest of our creative writers have known contemporary science, incorporated it in their works, and demonstrated the effects of scientific change as their protagonists attempt to come to grips with micro- and macrocosmic uncertainties. Relativity, structuralism, probability, quantum mechanics, entropy, and Heisenbergian indeterminacy influence the imaginative recastings of the human condition in these late 20th Centruy authors.

l. Scholarship Essays for DFSAA, with approximately eighteen Rhodes candidates from July through October 1981. (Consultation)

m. "The Science of the Real': Peirce's Semiotics and Emerson's 'The Poet'." *American Transcendental Quarterly*, Fall 1981. (Article)

In "The Poet" Emerson's very apparent preoccupation with language transcends concern with mere poetic rhyme-writing and versification. Rather, the work is based in a fairly coherent semiotic system concerned with everything, verbal or non-verbal, that may be perceived as a sign. A comparison of his thoughts with more structured semiotic system of Charles Sanders Peirce, often called the "Father of Modern Semiotic," reveals striking similarities.

n. "Some Great American Literary Atavisms." Nineteenth-Century American Literature, Rocky Mountain Modern Language Association Conference, Denver, CO. 17 October 1980. (Presentation)

Connects Edwards, Emerson, Thoreau, Dickinson, and Wharton as archetypal American artists.

o. "The Spider and the Bee: Typical Travellers in Swift's *A Tale of A Tub.*" South Central Society for Eighteenth-Century Studies, University of Texas, Austin TX. 6 March 1981. (Presentation)

In Swift's "The Battle of the Books," the spider's travels across his web and the bee's investigative flights represent Swift's polar views of the author-text-reader interaction represented in *A Tale of a Tub.* At one level, the entire publishing industry—author, bookseller, commentator—travels a web "spun out of its own entrails"; while at the opposite end of the spectrum, Swift himself generates in a *A Tale* the possibility of the bee's "sweetness and light."

p. "Sweetness and Light: The Bee in Swift's *Tale.*" English Seminar Series, USAFA, CO. 16 February 1981. (Presentation)

Swift's bee represents that strange blend of imagination and common-sense evident in the very best of artists and writers.

q. "Topics in Eighteenth-Century Literature." South Central Society for Eighteenth-Century Studies, Austin, TX. 6 March 1981. (Presentation)

Moderator and respondent, examining the techniques of Pope, Milton, and Bently.

r. "Villainy Reincarnate: Villain and Parasite in Jonson's *Sejanus* and *Volpone.*" Rocky Mountain Medieval and Renaissance Association, USAFA, CO. 11 April 1980. (Presentation); Also submitted to *English Literary Renaissance.* (Article)

Though Jonson's Roman tragedy, *Sejanus*, was a dismal failure, his successful comedy *Valpone*, produced three years later, is based on the actions of a villainous partnership identical in many respects to a corresponding partnership in *Sejanus*. This creative carry-over may help explain why *Valpone*, even as comedy, is so persistently seen as finally dark and pessimistic.

s. "Writing the Scholarship Essay" Rhodes Seminar Series, USAFA, CO. 25 August 1981. (Workshop)

Organization, vitality, and an exciting idiosyncratic approach are hard to come by, but these steps will help.

18. STIBRAVY, John A., Captain and Instructor

a. "Missile Launches." USAF Academy, CO: DFENG, May 1981. (Videotape)

This missile training film is now being shown to all SAC officers undergoing combat crew training at Vandenberg AFB, CA.

b. "The Rebellious Readers: How Do We Motivate Them to Read Our Material?" 29th International Technical Communication Conference, Boston, MA. 6 May 1982. (Forthcoming Presentation)

I explore reasons why so many publications go unread, and discuss ways in which to entice readers to use what we produce.

c. "The use of Instructional Media at the USAFA." (Research in progress)

I am researching student resistance to increased use of instructional media at the Academy in the light of studies which indicate that instructional TV is as effective as a human teacher for most courses.

19. STONE, William M., Major and Associate Professor

a. "Student Writing in Three Aims of Discourse." Diss. University of Iowa, 1981. (Dissertation)

I analyze and describe successful writing performance (evaluated by primary-trait scoring) in the expressive, referential, and persuasive aims of discourse.

20. THOMPSON, John M., III, Captain and Instructor

a. "A Case Study Report of the Experimental Freshman Composition Course at the Air Force Academy." Publisher/Research sponsor: National Endowment for the Humanities, University of Iowa. (Study in progress)

This report will be a qualitative evaluation of the freshman writing course designed by Major William E. McCarron at the University of Iowa as a member of the Iowa Institute on Writing. Its purpose will be to describe the course as it is taught at the Air Force Academy as fully as possible through analysis of selected portfolios of student writing, through analysis of course logs kept by instructors teaching the course, and through interviews with students taking the course. The case study approach was selected because no one has devised a method for establishing cause and effect in the teaching of writing with any certainty.

b. "Naked Thinking, or The Art of Writing Comments on Student Papers." Wyoming Conference on Freshman and Sophomore English, Cheyenne, WY. July 1981. (Presentation)

All teachers know that students do much more on a writing assignment than write the required paper. They reveal themselves to be apathetic, timid, belligerent, or fawning, and the most effective teaching takes place when the teacher accurately assesses these attitudes and responds to them appropriately, consciously choosing a style of his own.

c. "The Significance of Laughter in Sir Gawain and The Green Knight." Rocky Mountain Medieval and Renaissance Association, USAF Academy, CO. 10-11 April 1981. (Presentation)

As the numerous citations from medieval religious tracts demonstrate, the large amount of laughter in *Sir Gawain* is one of the ways by which we can tell that Gawain is in danger of sin. The resemblance between the laughter of Bertilak and his lady and the laughter of Lady Fortune in various medieval works suggests that the Bertilaks share the role of fortune in the Poem.

d. "The Theme of Honor and Fame in Selected Renaissance Poets." Diss. University of Iowa. Expected completion, December 1983. (Research in progress)

One of the conventions of renaissance elegies and epics (Milton *Lycidas* and *Paradise Lost* serve as convenient examples) is that the poet finds an occasion to refer to himself, usually in a self-deprecating way, but always with the motive of personal fame. Poetry, after all, seems to have originated as a means of achieving immortality for society's mores and customs. The motive of personal immortality, while not new in the renaissance, certainly becomes more obtrusive than it ever was with the Greek and Latin poets. My dissertation seeks to explore the sources of the quest for the poet's personal fame and its implications.

21. WALLISCH, William J., Jr., Lieutenant Colonel and Tenure Associate Professor

a. "The Ethics of the Electronic Revolution: Implications for the U.S. Air Force." *United States Air Force Academy Journal of Professional Ethics*, I, no 2 (November 1980), 33-34. (Article)

That the electronic revolution offers so much for our society is a foregone conclusion. But before those miracles turn sour, we well might take one more look at electronic information systems that might also dehumanize us all.

b. "Gee Whiz Teaching Miracles You Can Hold in Your Hand." To Executive Seminar, Colorado Commission on Higher Education, Denver. 2 April 1981. (Presentation)

To deans of Colorado universities and other officials of the Colorado System, a presentation concerned with computer assisted education. Demonstration included Texas Instruments Language Tutor.

c. Also with Jack Shuttleworth. "How to Grade Student Papers." Seminar to the Faculty of the Air War College, Maxwell AFB, AL. July 1981. (Presentation)

Grading procedures for War College teachers.

d. "Look Out. Here Comes the Electronic Revolution." Colorado Springs, CO. SERTOMA Club, 6 May 1981. (Presentation)

That there is an electronic revolution changing our society forever is a foregone conclusion. Rather than run away from it, it's a good idea to welcome the change and the electronic wonders it will bring with it.

e. "Mass Media in the AF." MAC HQ. May 1981. (Presentation)

f. "NCOs Teach The Blue Tube." *Sergeants Magazine*, October 1980, pp. 22-25. (Article)

How NCOs at USAFA join with English teachers to teach mass media and TV production to cadets in English 330 Honors.

g. "The Need for a Consortium for Educational Technology in Colorado." To the Colorado Commission on Higher Education, Conference on the New Technology, Colorado Springs, CO. 16 March 1981. (Presentation)

As a member of the CCHE Task Force, this presentation urged Colorado universities and colleges to form a Colorado-wide consortium in order to deal with the evolution in education prompted by the electronic revolution.

h. "Of Parents' Clubs and LOs." *Admissions Liaison Newsletter*, USAFARP 190-1, Number 8, August 1981, pp. 3-4. (Article)

Parents' Clubs are a great aid to the Academy in terms of keeping cadet morale high. Helping them to do so are the Liaison Officers, who join in club activities all over the nation.

i. "Our Academic Program at The USAFA." Parents Club of Minnesota, MN. 6 June 1981. (Presentation)

How academics are conducted at USAFA, especially given for parents' understanding.

j. "Talk To Parents' Club Leaves Big Impression." *FALCON Flyer*. 4 September 1981, p. 3. (Article)

Parents' clubs play an important role in supporting the Academy around the nation.

k. Also with Charles Beck. "Technical Illustration." *Courses, Components, and Exercises in Technical Communication*, pp. 122-135. Ed. by Dwight W. Stevenson. Urbana, Il: National Council of Teachers of English, 1981. (Textbook chapter)

Lesson plans in technical illustration for the teacher of technical writing. Exercises included.

l. "Through the Looking Glass." Colorado Commission on Higher Education, 16 March 1981. (Article)

Educators must keep knowledgeable about electronic innovations in the field of higher education.

m. "What About Ethics? Some Thoughts for Teachers of Media." *Educational & Industrial Television*, (June 1981), pp. 50-53. (Article)

Reporters must not fall into the trap of being controlled by the medium of television itself. Schools of journalism must include more ethics courses within the process of training reporters and producers.

n. "What's an LO?" *Admissions Liaison Newsletter*, USAFARP 190-1, no. 12, (December 1980), pp. 4-5. (Article)

LOs do a great deal for the Academy in terms of helping to bring outstanding candidates to its doors. Often they are overlooked when the kudos are being handed out.

CHAPTER K
Department of Foreign Languages

1. BUSH, Michael D., Captain and Assistant Professor

a. "Selected Variables in the Mathematical Formulation of a Model of Second-Language Learning." Sponsored by the Ohio State University and by the USAF Academy. (Dissertation Research)

For some years educators and linguists have attempted to explain why people learn a second language with varying degrees of success while all have learned a first language with no problem. I am investigating the relationship between second-language *learning achievement* and variables in the categories intelligence, experience, demographics, personality, attitudes, and perseverance. Not only are direct effects examined but interactions between categories of variables are identified and evaluated as well. Variables and interactions are being fitted into a statistical model using regression and factor analytical procedures.

b. "So You Think Computers Are Dehuman[illegible]." Proceedings of the Task Force on the Implications of Educational Technology, Colorado Commission on Higher Education. USAF Academy, CO. 16 March 1981. (Presentation)

To many educators, the use of computers in teaching is just one more dehumanizing element in our already too technological world. This presentation addressed certain aspects of education today, illustrated their dehumanizing qualities, and states that contrary to what many believe, computers and other new technologies provide an excellent means to make education more human. Teachers are given a good tool to help them to better deal with individual differences, certainly a process that constitutes the essential ingredient of humanistic education.

c. "The Application of Information Processing Techniques in the Teaching of Foreign Language at the USAF Academy."

See K5b.

2. CRAWFORD, Walter T., Captain and Assistant Professor

a. "A More Precise Definition of the Variable Semesters of Previous Study in Foreign Languages." (Research in progress)

Traditionally, placement in Foreign Language courses has in large part been based primarily upon previous study experience and scores on placement examinations. Experience has shown, however, that the number of semesters of foreign languge study is *often* a poor predictor. This is due to the wide variation of courses at schools across the country as well as to the various levels of study possible within any given school system, i.e., high school, junior high school, or elementary school. The purpose of this study is to identify and research other variables such as type of high school language teaching program, elapsed time since language study, and student assessment of previous programs of study that affect the significance of semesters of previous study. A greater understanding of these types of variables will allow more precise measurement of previous study experience and thus more accurate foreign language placement.

3. FUJITA, James N., Major and Associate Professor

a. "A Preliminary Inquiry into the Listening Strategies of Successful and Nonsuccessful Second Language Learners in Beginning College Japanese." (Research in progress)

This study seeks to determine what students do in order to comprehend a listening comprehension passage in Japanese. A questionnaire and an interview were utilized to ascertain whether students take written notes, mental notes, use a combination of written and mental notes, etc. In addition, the interview seeks to determine how students prepare themselves to listen prior to hearing the passage as well as what they do during the first and second playing of the passage. The data is currently under investigation.

b. "A Preliminary Inquiry into the Listening Strategies of Successful and Nonsuccessful Second Language Learners in Beginning College Japanese." Diss. forthcoming. The Ohio State University, Columbus, OH. (Dissertation)

The effectiveness of the computer as a teaching tool is examined

4. MUELLER, Gunther A., Captain and Associate Professor of German

a. "The Effects of a Contextual Visual on Recall Measures of Listening Comprehension in Beginning College German." *Modern Language Journal*, 64 (1980), 335-340. (Article)

Two experiments were conducted investigating the effects of a contextual visual on recall measures of listening comprehension in beginning college German. Subjects in Experiment I (N = 123) were less proficient in German than were subjects in Experiment II (N = 76). A factorial design was used to examine the effects of three independent variables. The contextual visual variable consisted of three levels: (1) seeing the visual *before* hearing the passage, (2) seeing the visual *after* having heard the passage, and (3) hearing the passage *without* seeing the visual. The classroom variable consisted of nine intact classes of German (six in Experiment II). The aptitude variable consisted of a high and low level. Comprehension was measured by a free-recall English summary of the passage scored on the basis of the number of semantic propositions it contained. Results of the study suggest that the extent to which contextual visuals enhance listening comprehension is inversely related to the listener's level of language proficiency. While the visual enhanced comprehension for the less proficient students, it had no statistically significant effect in the case of the more proficient students.

b. "The Relationship Between Attitudes Toward Foreign Language Learning and Language Learning Success."

See K6a.

5. ROWE, A. Allen, Major and Assistant Professor

a. "CEGOLLE or Can Big Bird Make it Happen." Proceedings of the Task Force on the Implications of Educational Technology, Colorado Commission on Higher Education, USAF Academy, CO. 16 March 1981.(Research in progress)

Computers can assist instruction, CAI, but it is better if they enhance learning, whence a new acronym—CEL. This learning should be an experience which involves as many of the senses as possible, so as to maximize the learning outcome. It should also be an inherently interesting and enjoyable experience. Such learning experiences can be optimized by properly structured computer games. Thus CEGOLLE (Computer Enhanced Game Optimized Language Learning Experience) promises to be a new and powerful tool for language teachers as they expand the applications of computers in foreign language teaching.

b. Also with Michael D. Bush. "The Application of Information Processing Techniques in the Teaching of Foreign Language at the USAF Academy." (Research in progress)

The purpose of this research is to investigate the applicability of Word Processing, Computer Managed Instruction, and Computer Assisted Instruction in the preparation and presentation of course and testing materials in the Department of Foreign Languages. Preliminary results show these principles to have promise in improving the effectiveness of Department personnel as well as in improving the quality of instruction.

The effectiveness of Department personnel is being improved by increasing the amount of work produced with no increase in time expended. The quality of instruction is being improved by increasing information flow between faculty and students. Examinations, an integral part of the instruction process, are being improved by using these techniques (assessment of examination reliability, for example). Instructors are also provided with an increased quality of information on student performance. This feedback allows problems of individual students to be addressed more effectively.

Computer printouts are being used extensively in DFF to achieve a greater degree of individualization of instruction and to improve the quality of examinations

6. ROZDAL, Edward J., Captain and Assistant Professor

a. , Also with Gunther A. Mueller. "The Relationship between Attitudes toward Foreign Language Learning and Language Learning Success." (Research in progress)

The purpose of this research is to investigate the relationship between attitudinal and achievement variables among cadets enrolled in the core language courses. Because we teach seven different languages across 13 courses to the same population (4th Classmen), it is possible to draw comparisons across and within different courses and across or within the various levels. The results can help to identify student-perceived strengths and weaknesses and ultimately improve the quality of instruction.

b. "Language Learning at the USAF Academy—The Perspective of Graduates." (Research in progress)

Recent international events have focused high-level national attention on foreign language study at all educational institutions around the country. In conjunction with recommendations made by the President's Commission on Foreign Language and International Studies, the Department of Foreign Languages at USAFA is reviewing and evaluating its foreign language programs. A part of this review included a survey of members of the Academy Association of Graduates. The purpose of this survey was three-fold: (1) to determine if and how the Academy graduates have used the language they studied at USAFA, (2) to determine their attitude toward language study, and (3) to consider their recommendations, based on their personal experiences, for improving or modifying the Academy's foreign language courses.

7. SCHAEFFER, Reiner H., Major and Assistant Professor

a. "Meaningful Practice on the Computer: Is *It* Possible?" *Foreign Language Annals*, 14:2 (1981) 133-137. (Article)

I investigated the effectiveness of structural and semantic computer practice across two levels of verbal aptitude. The experiment was conducted with students enrolled in beginning college German who had had no previous high school language training. Subjects were randomly assigned to one of three groups: (1) Structural Practice, (2) Semantic Practice, and (3) No Practice (Control). Groups 1 and 2 practiced a specific grammatical concept on the computer utilizing structural and semantic exercises, respectively. A structural exercise could be accomplished based on knowledge of structure alone, while a semantic exercise could be successfully completed only through understanding the meaning of the item/problem. The control group had no practice. All three groups were administered a 40-item post test consisting of both a structural and a semantic measure. The results of the study support previous research on the importance of meaningful (semantic) practice in the second language learning process. This study further suggests that the advantages of meaningful language practice are evidently independent of interpersonal interactions. In short, it seems that what goes on directly between student and material is an extremely important factor.

CHAPTER L
Office of Instruction for Geography

1. BARNES, C. Taylor, Major and Assistant Professor

a. "Geographic Factors Relating to the Location of Military Retirees." 77th Annual Meeting Association of American Geographers, Los Angeles, CA. April, 1981. (Presentation)

The pattern and magnitude of governmental influence in the redistribution of population is evident through the movement of military personnel. I presented a model which hypothesizes that military members select a retirement location based on their military experiences. Using logit transformation techniques, I determined that military experiences are excellent predictors of military retirees' locations.

b. Also with Curtis C. Roseman. "The Effect of Military Retirement on Population Redistribution." *Texas Business Review*, May-June 1981, 100-104. (Article)

A military retiree's choice of a retirement location is not the result of random selection but is heavily influenced by exposure from military experiences. We found that governmental policies concerning the siting and alignment of military bases are not only redistributing the military population but are also influencing the location of future military retirees and, thus, contributing to long-term population redistribution.

c. "United States Military Migration: Patterns and Processes." Diss. University of Illinois. (Dissertation research)

Department of Defense policy concerning the stationing of the military population has a direct impact on population redistribution patterns. The rate and volume of the movement of military personnel and their dependents represents an important element in this redistribution. There is, however, an important additional population redistribution impact resulting more indirectly from Defense Department actions. With a strength in excess of 1.3 million persons, the geographic patterns of the retired military population reflect the long-term effects of governmental relocation policy. Each year approximately 45,000 to 50,000 military members retire from active duty and select a retirement location. These retirees have considerable impact on the areas in which they choose to live. Using a log likelihood function, I found a high positive relationship between the selection of a retirement location and military experiences. I developed a logit model which explains the processes underlying the military retiree's selection of a retirement location.

d. "Intercultural Education for the Indiana ANG."
See L3l.

e. "Intercultural Education for Italy."
See L3o.

2. BURRELL, Stephen F., Lieutenant Colonel and Associate Professor

a. "The Impact of Air Force Base Realignments on Remote Communities in the United States." Diss. University of North Carolina. (Dissertation research)

I am determining the extent and duration of socioeconomic changes generated in host communities when a nearby base is closed.

3. MITCHELL, William A., Lieutenant Colonel and Tenure Associate Professor

a. Also with Carl W. Reddel and Bryant P. Shawl. *The Republic of Turkey: Intercultural Education and the Colorado Air National Guard.* USAF Academy Technical Report 81-5 (May 1981), pp. 286. (Report)

This extensive report is based on the Air Force Academy's program in intercultural education developed for the Colorado Air National Guard's deployment to Turkey and participation in NATO's "Display Determination" exercise.

Lt Col Mitchell and Dr. Schwarz, DFSOG, discussing how the M-X missile system will affect the physical environment in the proposed deployment area. Lt Col Mitchell and Dr. Schwarz are preparing reports on both human and physical impacts of the proposed M-X.

b. "Earthquakes in Turkey: Reconstruction Problems, Damage Prediction, and Recovery Forecasting for Earthen Structures."

See G10c.

c. *Cultural Awareness: The 122nd Tactical Fighter Wing, Indiana Air National Guard, Prepares for Deployment (Dawn Patrol).* USAF Academy Technical Report 81-10 (October 1981), pp. 174. (Report)

This report was based on a program by members of the USAF Academy's Middle East Studies Group which prepared the 122nd Tactical Fighter Wing for deployment to Askisehir, Turkey. Presentations emphasized basic knowledge about the history, geography, culture, politics and language of Turkey. Emphasis was on developing positive attitudes toward our NATO ally by providing accurate knowledge and sensitivity to the Guardspeople about different cultural values and attitudes.

d. "Rev. of *Disasters: The Anatomy of Environmental Studies,*" by John Whitlow. *Geographical Review,* 1971, (October 1981), 477-479. (Review)

e. "Intercultural Awareness for American Military Forces." Washington, D.C., Association of American Geographers, 1971. *Program Abstracts,* Association of American Geographers, 77th Annual Meeting, Los Angeles, CA. April 19-22, 1981. Also presented at the Annual Meeting. (Presentation and Publication)

I demonstrated how not knowing cultural and historical determinants of host nations can be detrimental to successful mission accomplishments. I gave evidence of how positive motivation with both language and knowledge can reduce ethnocentrism and cultural arrogance.

f. "Military Geography." Special Session, 77th Annual Meeting, Association of American Geographers, Los Angeles, CA. April 1981. (Presentation)

I chaired a special session on military geography at the Annual Meeting of American Geographers.

g. "The Republic of Turkey: Yesterday, Today, and Tomorrow." Pikes Peak Torch Club, Colorado Springs, CO. 15 April 1981. (Presentation)

The talk was basically a culture capsule of Turkey, ranging from the Ottoman era through the Ataturk era and into the future.

h. "Erasing Stereotypes: The Case of Turkey." Rotary Club of the Broadmoor District, Colorado Springs, CO. 5 February 1981. (Presentation)

I surveyed the human environment of Turkey and emphasized how negative stereotypes influenced both American and Turkish perceptions of each other.

i. "A Geographer Looks at Turkey." National Sojourners, Colorado Springs, CO. 11 February 1981. (Presentation)

A discussion with slides of the modernization processes in Turkey over the past 20 years.

j. "Perspectives on Turkey." Kiwanis Club, Colorado Springs, CO. 18 March 1981. (Presentation)

I talked about contemporary problems in Turkey, such as opium poppy, modernization, socioeconomic issues, natural hazards, and the military coup.

k. "A Visual Journey to Turkey." Pikes Peak Chapter of Parents Without Partners, Colorado Springs, CO. 31 July 1981. (Presentation)

I focused on the role of women, marriage, and the impact of Islam in Turkey.

l. Also with C. Taylor Barnes, Mark G. Ewig, William B. Hammill, Frank W. Kyriopoulos, Edward D. Menarchik, Carl W. Reddel, Bryant P. Shaw, Clay W. Stewart, and Robert K. Tiernan. "Intercultural Education for the Indiana Air National Guard." 122nd Tactical Fighter Wing, Ft. Wayne, IN. 7, 8 March and 4, 5 April 1981. (Presentation)

Our purpose was to present basic knowledge about the history, geography, culture, politics, and language of Turkey. We also emphasized interpersonal relations, intercultural awareness, and sensitivities of Turkish people.

m. "What a Site Survey Team Should Know." 122nd Tactical Fighter Wing, Ft. Wayne, IN. 5 January 1981. (Presentation)

I presented a four-hour session on the physical and human environment of Turkey, along with the military structure and host base operational characteristics.

n. "Intercultural Training for the Massachusetts Air National Guard." 267th Combat Communication Squadron, Wellesley, MA. 21 March 1981. (Presentation)

Emphasis was on language and intercultural education for their deployment with "Dawn Patrol" to Turkey.

o. Also with C. Taylor Barnes, Charles J. Bohn III, and William B. Hammill. "Intercultural Education for Italy." 127th Tactical Fighter Wing, Michigan Air National Guard, MI. 15 August 1981. (Presentation)

p. Also with William B. Hammill and Richard S. Rauschkolb. "Cultural Awareness for the 74th Tactical Fighter Squadron." 74th TFS, England AFB, LA. 26 August 1981. (Presentation)

I was invited to present a five-hour program on Turkey to the first regular unit to deploy A-10s to Turkey. Our program focused on a culture capsule, Ataturk, the military psyche, Turkish law, Islam, and language.

q. "HQ TAC's Checkered Flag Workshop." TAC, Langley AFB, VA. 26-28 September 1981. (Presentation)

I was invited to give the keynote address and participate in HQ TAC's workshop of Rapid Deployment Forces, AWACS units, Tactical Air Support groups, and Tactical Control groups.

r. Also with William J. Weida. "Using the Growth Curve to Forecast Recovery from Military-Induced Disaster." (Research in progress)

We collected data in Italy during June 1981 which will be used to validate and enhance the predictive ability of our "straw man" model based on the S-shaped growth curve. The Italian data should provide accurate specification of the time axis on our recovery model and will be used eventually to predict post-nuclear environments.

s. "Faculty Research on the M-X System." (Research in progress)

I served as DF coordinator and manager for interdisciplinary research on the M-X system for HQ USAF.

4. SCHWARZ, David E., Ph.D. and Visiting Associate Professor

a. "Remote Sensing: A Brief Introduction to Sensors, Platforms and Techniques." Invited chapter in second edition of *The Surveillant Science* (R. Holz, editor). Boston: Houghton Mifflin [forthcoming 1982]. (Chapter in book)

In this manuscript, now accepted for publication, I present an introduction to remote sensing devices, the platforms on which they are mounted, and basic techniques of image and digital data enhancement and manipulation for extracting earth resources information.

b. "Remote Sensing—The Shape of the Future." 1981 Conference on Remote Sensing Education (CORSE-81), Purdue University, IN. 21 May 1981. (Presentation)

My short note, entitled "Down to Earth Remote Sensing," is included in the *CORSE-81 Proceedings*.

c. "Radar Remote Sensing," Remote Sensing Workshop, Association of American Geographers, Los Angeles, CA. 18 April 1981. (Presentation)

The basics of radar remote sensing were introduced and applications of the sensing technique to geoscience problems were outlined.

d. "Impact of the Proposed M-X Missile System on Quality of Life: Lessons from Recent Western Boomtowns." (Forthcoming presentation)

I will make this presentation at a Military Geography session at the annual meetings of the Association of American Geographers in San Antonio in April 1982. The title of this presentation suggests the basic thrust of research I am conducting this academic year at the Air Force Academy.

5. SAUNDERS, Earl F., Lieutenant Colonel and Associate Professor

a. "Trip Distribution of General Aviation." Diss. University of Minnesota. (Dissertation research)

This report evaluates the distance decay of trip patterns of general aviation. Polynomial curve fitting techniques are used to derive a mathematical function for use in predicting future travel patterns. Band narrowing techniques of an origin/destination matrix are used to assess the intra-regional interaction between city pairs. This is the only known study of general aviation traffic based on the 1975 FAA survey of flight activity.

b. "The USAF Academy Summer Alumni College After-Action Report." USAF Academy, CO. (Report)

I summarize the conceptualization and implementation of the first alumni college at a service academy. The Alumni College was held at the Air Force Academy in the summer of 1981. The report addresses the major planning factors and evaluates the success of the program. The document be used as a planning guide for future alumni colleges.

CHAPTER M
Department of History

1. BOHN, Charles J. III, Captain and Instructor

a. "Italy: Crossroad of Conquerors." 127th TFW, Selfridge Air National Guard Base, MI. 15 August 1981. (Presentation)

As a part of the Cultural Awareness Program, my presentation concentrated on the constant traffic of conquerors (the Saracens, the Normans, the Hohenstaufens, the French, the Spanish, etc.) through southern Italy which contributed significantly to the rich cultural heritage of the peninsula. The nineteenth century *Risorgimento* (which culminated with Italian independence in 1861, the Fascist and World War II experiences, and the problems of postwar Italy) were also discussed to enable the Guard unit to better understand their hosts' heritage.

b. "Intercultural Education for Italy."
See L3o.

2. BOROWSKI, Harry R., Major and Associate Professor

a. "A Narrow Victory: The 1948 Berlin Blockade and the American Military Response." *Air University Review* (July-August 1981). (Article)

This article evolved from a paper given at the 1979 American Historical Association. It examines U.S. military planning and capability on the eve of the 1948 Berlin Blockade and argues that both were found wanting. I further contend that the U.S. response was careful and cautious and was designed to allow room for a diplomatic settlement, largely because there was no other realistic alternative. These positions contrast rather sharply with the conventional interpretations of American reaction to the blockade.

b. *A Hollow Threat: Strategic Air Power and Containment Before Korea*. Greenwood Press (forthcoming, February 1982). (Book)

The awesome power of the atomic bombs dropped on Japan at the end of World War II created in the popular postwar mind an image of American military invincibility. In fact, America drastically reduced its military strengths soon after the war, and the atomic deterrent did not fill this security gap. Bombs were few, and the organization responsible for delivering these weapons, the Strategic Air Command, was ill prepared to execute its charge.

The Soviet Blockade of Berlin in 1948 first tested American Cold War readiness. The new Air Force responded with a massive and successful airlift that exceeded both American and Soviet expectations. But the Berlin crisis was a close call, and the Soviet challenge prompted a critical examination of strategic air capabilities. SAC's new commander, General Curtis LeMay, struggled with the Truman administration during the next two years for a truly effective airborne deterrent. By 1950, LeMay had eliminated the serious combat weaknesses in SAC—just in time for the new Cold War crisis, the Korean Conflict.

3. CIRAFICI, John L., Captain and Instructor

a. "The Air Campaign Against the Democratic Republic of Vietnam: An Examination of Certain Long and Short Term Factors Contributing to the Decision to Bomb the North." National Endowment for the Humanities Seminar, University of Colorado, Boulder, CO. 7 August 1981. (Presentation)

My paper addressed the role of airpower in the Cold War, the Laotian Crisis, and other factors which led eventually to the ill-conceived decision to use the threat of destruction as the muscle behind our (the U.S.) coercive diplomacy.

4. CONVERSE, Elliott V. III, Major and Assistant Professor

a. "The American Military Establishment and the Creation of a Postwar Overseas Military Base Network, 1942-1948." Diss. Princeton University, Princeton, N.J.. (Dissertation reseach)

The establishment of an extensive postwar overseas base system and military's efforts to have these plans implemented following World War II. My emphasis is on analyzing the adaptation of plans to changing forces and circumstances.

Professor Hata delivers a paper at The 9th Military History Symposium

5. COX, Gary P., Captain and Instructor

a. "Past as Prologue? The Relevancy of the Great War." A "Books and Ideas" article submitted to *Air University Review* (forthcoming). (Article)

I review three recent books on World War I. I note the relative neglect of the Great War by military professionals and suggest reasons why this conflict should be studied by soldiers and statesmen as well as scholars.

6. CROWELL, Lorenzo M., Jr., Lieutenant Colonel and Assistant Professor

a. "The Madras Army in the Northern Circars, 1832-1834: Pacification and Professionalism.' Diss. Duke University, Durham, NC. (Dissertation research)

This case study of a routine pacification campaign will attempt to demonstrate, first, that the internal security operations of the Madras Army were essential to the normal functioning of the Madras Presidency Government and, second, that the Madras Army in the 1830s was a highly professional force.

7. DIXON, Joe C., Captain and Associate Professor

a. *Defeat and Disarmament: Allied Diplomacy and the Politics of Austrian Military Affairs, 1918-1922.* University of Delaware Press (forthcoming). (Book)

Austrian military affairs after World War I were dominated by the victorious Western powers who attempted to impose disarmament on Austria. Austrian political instability, economic devastation, the Bolshevik threat, quarrels among the Allies, and refusal of the Austrian population to give up private stores of arms complicated this task. I analyze the ultimate failure of Allied policy, which permitted and finally stimulated the rise of private political armies representing the socialist left and the fascist right within Austria.

b. Editor, *The American Military and the Far East.* Proceedings of the Ninth Military History Symposium. Washington D.C.: GPO (forthcoming). (Book)

This is a collection of papers delivered at the Ninth Military History Symposium held at USAFA from 1-3 October 1980.

8. HOWEY, Allan W., Captain and Instructor

a. Also with Russell W. Mank. "Base of the Ramparts." April 1981. Colorado: U.S. Air Force Academy. (Report)

Conducted oral history interviews in conjunction with the USAF Academy's Oral History Program with Mrs. Wilton W. Cogswell, Jr., Colonel Columbus Savage, Major General Delmar T. Spivey, Mr. Risden J. Westen.

9. MANK, Russell W., Jr., Lieutenant Colonel and Tenure Professor

a. "Media (Newspaper) Influence on the MX Decision." (Forthcoming article)

This forthcoming article for the Special Assistant for MX Matters will evaluate the coverage given to, and the position taken on, the MX proposals by several of the nation's leading newspaper since 1979.

b. "Base of the Ramparts"
See M8a.

Conducted oral history interviews in conjunction with the USAF Academy's Oral History Program with Brigadier General Robert F. McDermott and Major General Robert H. Warren.

10. PITTMAN, Lester G., Captain and Assistant Professor

a. "The Citadel Education." *Alumni News* (forthcoming). (Article)

I explore the philosophical foundations and principles of the distinctive form of education which has evolved at The Citadel. Topics discussed are the citizen-soldier, discipline, duty, honor, spirit, and the Fourthclass System.

b. "Modern World History." (Research in progress)

I have done extensive research and reading on the subject of modern world history during the past summer and this semester. This research has included both historical and pedagogical works.

11. RAUSCHKOLB, Richard S., Captain and Assistant Professor

a. "The Arab-Israeli Conflict." (Forthcoming) (Textbook article)

The article is being written for the book, *Modern Warfare and Society*, which is used as the main text in the Academy's basic military history course required of all cadets. This paper deals with the roots of the conflict and

traces the increase in hostilities between the Arabs and Jews from the early twentieth century until the eve of the Six-Day War in 1967. The paper focuses on military developments by other sides and the 1948 and 1956 wars.

b. "The Military in Turkish History." 74th Tactical Fighter Squadron, England AFB, . 25 August 1981. (Presentation)

This was part of the Middle East Studies Group's program to promote cultural awareness in units deploying to the Middle East.

c. Editor, *Western Perceptions and Asian Realities*. The Harmon Memorial Lectures in Military History, No. 23. USAF Academy. (Pamphlet)

12. REDDEL, Carl W., Lieutenant Colonel and Permanent Professor and Head

a. "Intercultural Education For The Indiana ANG."
See L3l.

b. *The Republic of Turkey: Intercultural Education and the Colorado ANG.*
See L3a.

13. REED, George A., Captain and Instructor

a. "Peoples' War." (forthcoming). (Textbook Article)

This article is being written for the book, *Modern Warfare and Society*, which is used as the main text in the Academy's basic military history course required of all cadets. The chapter deals with the phenomenon of revolution and unconventional warfare in the twentieth century. It consists of a discussion of the theoretical roots of Peoples' War, and uses the French experience in Vietnam, 1945-1954, as a case study.

14. SHAW, Bryant P., Captain and Instructor

a. "Intercultural Education for Indiana ANG."
See L3l.

b. *The Republic of Turkey: Intercuitural Education and The Colorado ANG.*
b.See L3a.

15. SHINER, John F., Lieutenant Colonel and Professor and Acting Head

a. "*Foulois and the U.S. Army Air Corps, 1931-1935*. Washington D.C.: GPO (forthcoming). (Book)

This study examines the important changes occurring within the Air Corps during General Benjamin Foulois' years as chief. I analyze this time of transition for the Army air arm with particular attention to the development of strategic air doctrine, the birth of the GHQ Air Force, and the issues of money, manpower, and equipment. General Foulois remains the central figure in this volume, for he was frequently the individual who stimulated change. The Office of Air Force History is publishing the book; it should be available in 1982.

b. "The Armed Forces' Sense of Mission." Southwestern Social Science Association Annual Meeting, Dallas, TX. 27 March 1981. (Presentation)

Sponsored by the Inter-University Seminar on the Armed Forces and Society, the program included papers on the use of the Army in coast defense prior to World War I, the mission of the fast battleship during World War II, and the Luftwaffe's lack of a strategic bombing capability during the Second World War. As discussant, I summarized, compared, and critiqued these three papers.

c. "The Air Corps, the Navy, and Coast Defense, 1919-1941." *Military Affairs* (October 1981). (Article)

A revised version of a paper presented at the Northern Great Plains History Conference in 1980, analyze the continuing debate between the Air Corps and the Navy over responsibility for the coast defense mission. Both oranizations claimed that mission was their own exclusive preserve, and each was unwilling to cooperate with the other. Yet neither the Air Corps nor the Navy was able to do the job alone. The successful Japanese attack on Pearl Harbor was one consequence of this rivalry. There is a message here for our armed services today.

d. "The General and the Congressmen: The Political Troubles of Major General Benjamin Foulois." (forthcoming). (Presentation)

I will present this paper at the 1982 Southwestern Social Science Meeting in San Antonio. As chief of the Air Corps, 1931-35, General Foulois had his problems with Congress. My study analyzes how Foulois got himself into such a predicament in 1934 that members of the House Military Affairs Committee demanded he be fired.

Harmon Memorial Lecture, 9th Military History Symposium. (L to R: Lt Col Wheeler, Mrs. Orth, Admiral McCain, General Orth, Professor Iriye).

16. SPIRES, David N., Major and Associate Professor

a. *Image and Reality: The Career of the Reichswehr Officer, 1921-1933.* (Currently being reviewed for publication by Archon Press.) (Book)

I examine the Versailles Treaty German Army from the inside by focusing on various officer programs. I argue that the professional army of Weimar Germany offers instructive parallels for today's professional military and that the internal problems facing Reichswehr leaders affected crucial political decisions taken in the years immediately prior toHitler's seizure of power.

b. "The Education and Training of German General Staff Officer Candidates, 1921-1933." Citadel's Symposium on Hitler and the National Socialist Era, Charleston, S.C. 24-25 April 1980. (Presentation)

Focus is on the General Staff training program and the narrow technical-tactical orientation of the program that fostered the conformist attitudes of the specialist rather than the broad, independent outlook of the generalist. Expected to be published (fall 1981 or spring 1982) by the Citadel in their proceedings of the Symposium on Hitler and the Third Reich (April 1980).

c. Selectee on Scholar-Diplomat Seminar on Europe with emphasis on NATO, U.S. Department of State (March 1981). (Consulting)

17. THOMPSON, John M., Distinguished Visiting Professor

a. *Revolutionary Russia 1917.* New York: Scribner's, 1981. (Book)

A short narrative account of the Russian Revolution for the student and non-specialist reader. Treats the major events and personalities, taking account of recent Western and Soviet scholarship, and raises leading questions of analysis and interpretation about the Revolution.

18. TITUS, James, Major and Assistant Professor

a. "Soldiers When They Chose To Be So: Virginians at War, 1754-1763." Diss. Rutgers University, New Brunswick, N.J. (Dissertation research)

I am studying how the largest English colony in North America waged war in the mid-eighteenth century. My plan is to use the Seven Years' War as a lens for bringing into sharper focus the social and political culture of the Old Dominion.

19. TRETLER, David A., Major and Assistant Professor

a. "The Arab-Israeli Wars: 1967-1975" (forthcoming). (Textbook Article)

This article is being written for the book, *Modern Warfare and Society*, which is used as the main text in the Academy's basic military history course required of all cadets. It analyzes operations during the wars of 1967 and 1973 and discusses political, economic, and military developments in Israel and the Arab countries between the two wars and leading up to the Camp David Accords. The major thrust of the article is to examine the phenomenon of limited conventional war under the nuclear umbrella.

CHAPTER N
Department of Law

1. ASH, George W., Captain and Associate Professor of Law

a. "Association of Graduates Bylaws." (Research)

The AOG bylaws were rewritten to restructure the offices and day-to-day operation of the organization. I conducted research on the Colorado Non-Profit Corporation law to insure modifications were consistent with the statute. I assisted in the writing of the proposed bylaws during October 1981.

b. "Liaison Officers Briefing." Liaison Officers, USAF Academy, CO. September 1981. (Presentation)

I participated in several briefings given to visiting liaison officers on the Cadet Honor Code and the cadet disenrollment system.

c. "Proposed Changes to the Cadet Honor Code Administration." (Research)

I conducted research on the different methods used by the service academies for disenrolling cadets. The research included studying changes necessary to the current regulations to implement various proposals.

d. "Checkpoints on Changes to the Cadet Honor Code Administration." *AOG Magazine*, forthcoming. (Article)

2. BLACK, John A., Captain and Assistant Professor

a. Also with William B. Hammill, William C. Schmidt, and Robert J. Wilson. *Introduction to Law.* USAF Academy, CO.: Department of Law, 1981. (Textbook)

For use in Law 300. This is a civil law text which addresses property law, torts, contracts, and selected constitutional issues with case excerpts.

3. DONNELLY, Michael, Major and Associate Professor

a. "Sale of Real Property in Colorado and Hawaii." (Research)

I wrote a contract for sale suitable for use in Hawaii and made minor revisions in the standard forms used in Colorado. I also rewrote a Colorado lease form in order to make it more helpful to military personnel.

b. "Dual Compensation." (Research)

I advised several dentists about how the prohibition against dual compensation applies to reserve officers.

c. "Manual for Courts-Martial and Military Rules of Evidence." (Research)

I researched changes to the MCM and MREs, as well as related court decisions in order to rewrite portions of the Law 400 text.

d. "Income Tax and Trust Income." (Research)

I researched federal and state taxation of cadet trust income as background for a legal opinion.

e. Also with Peter Harry and Kirk Samelson. *Law for Commanders.* USAF Academy, CO.: Department of Law, 1981. (Textbook)

For use in Law 400, this deals with civilian/military criminal law, evidence, and international laws of war.

4. HAMMILL, William B., Captain and Assistant Professor

a. "The Impact of Turkish Law on ANG Personnel Deploying to Turkey." Indiana ANG, Fort Wayne, IN. 3-5 April 1981. (Presentation)

Covered criminal law and procedures in Turkey.

b. "The Impact of Italian Law on ANG Personnel Deploying to Italy." Michigan ANG, Selfridge ANG Base, MI. 14-16 August 1981. (Presentation)

Covered criminal law and procedures in Italy.

c. "Modified Briefing on Turkish Law." 74th TFS (TAC), England AFB, LA. 25 August 1981. (Presentation)

d. *Introduction to Law.*
See N2a.

5. HARRY, Peter J., Captain and Assistant Professor

a. "Estate Planning." DFBS, USAF Academy CO. 25-26 September 1981; DFCE, USAF Academy, CO. 15 October 1981. (Presentation)
See N13a.

b. *Law for Commanders.*
See N3e.

6. JAYNE, H. Martin, Captain and Assistant Professor

a. "Legal Careers in the Air Force." USAF Cadets, USAF Academy, CO. September 1981. (Presentation)

7. JOHNSON, Philip, Lieutenant Colonel and Tenure Associate Professor

a. "Estate Planning." DFPS, USAF Academy, CO. 27 August 1981; DFF, USAF Academy, CO. 28 August 1981; DFC, USAF Academy, CO. 4 September 1981; PACAF, Hawaii, 15-19 September 1981; Pentagon, Washington, D.C. 29 August-3 September 1981; DFEGM, USAF Academy, CO. 23 October 1981; DFAN, USAF Academy, CO. 10 November 1981.
See N13a.

8. KINEVAN, Marcos E., Colonel and Professor and Head

a. *Personal Estate Planning,* Englewood Cliffs: New Jersey: Prentice-Hall, Inc., 1980. (Book)

My book first addresses the problems of accumulating an estate while trying to avoid the financial pitfalls which can seriously (and needlessly) deplete an estate. I then deal with methods and problems of distributing that estate as our time to enjoy it on a carnal level grows short. I present a good deal of substantive information, as well as sound advice on the practical aspects of saving and investing. If this book doesn't tell you exactly what you need to know about personal estate planning, at least you'll know which questions you should be asking.

Colonel Kinevan researches the legal rulings regading estate planning.

9. SAMELSON, Kirk S., Captain and Assistant Professor

a. "Obligation to Support Mentally Retarded Children Over Age 18." (Research)

I conducted research for a faculty member into parental and state obligation by law to support a mentally retarded child

b. Also with Star Waring. "Non-Indian Federal Reserved Water Rights," *Denver Law Journal*, 58, (4), 1981. (Article)

I co-authored an article on Federal Acquisition of Water Rights Through the Reserved Rights Doctrine.

c. "Reserved Water Rights on Air Force Property," *Air Force Law Review*, forthcoming. (Article)

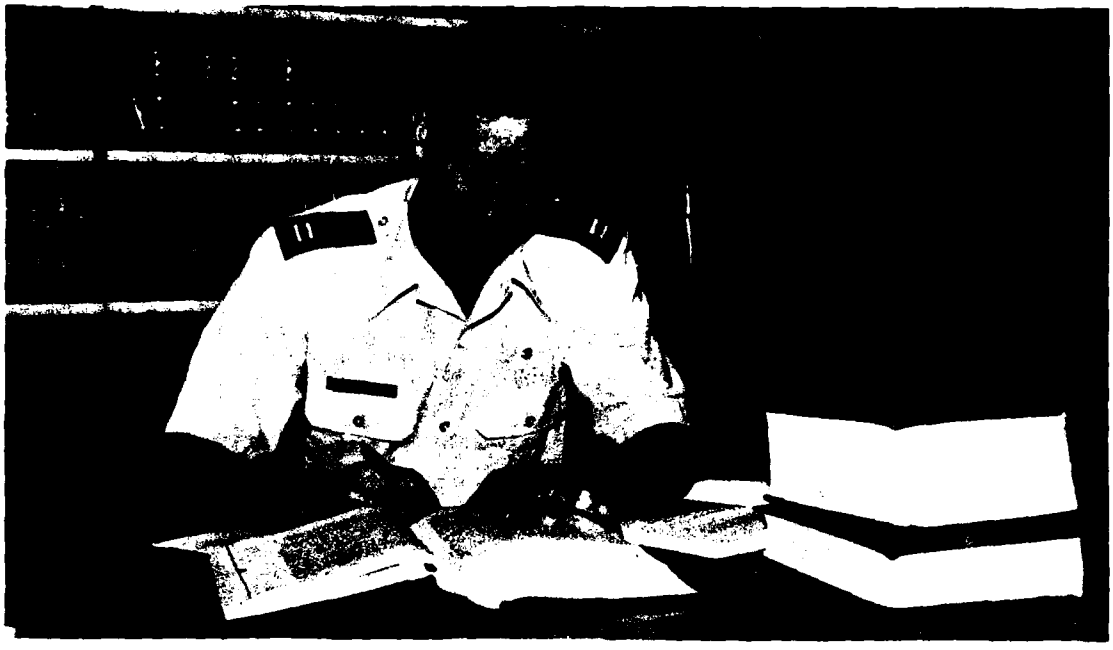
I conducted research on how the Air Force could acquire water rights through use of the Reserved Rights Doctrine.

d. "Water Acquisition for the M-X Project." (Research)

I am conducting research into methods of water acquisition and potential legal problems that may be faced by the Air Force in its efforts to acquire water for the M-X missile system.

e. "Estate Planning." DFACS, USAF Academy, CO. 10 October 1981; DFCE, USAF Academy, CO. 16 October 1981; DFAN, USAF Academy, CO. 3 November 1981; DFMS, USAF Academy, CO. 17 November 1981. (Presentation)
See N13a.

f. *Law for Commanders.*
See N3e.



Capt Samelson does independent research of water law.

10. SCHMIDT, William G., Major and Assistant Professor

a. "Estate Planning." Norton AFB, CA. 14-15 October 1980; Space Division, Los Angeles AS, CA. 16-17 October 1980; USAFA Alumni College, USAF Academy, CO. June 1981; DFAN, USAF Academy, CO. 30 September 1981; DFEGM, USAF Academy, CO. 22 October 1981. (Presentation)
See N13a.

b. "Memorandum Legal Opinion, Civilian Use of Fairchild Hall Exchange." (Research)

c. "Faculty Acceptance of Grants, Fellowships, and Honoraria." (Research)

I conducted research into the statutory and regulatory restrictions on faculty members accepting grants, fellowships, or other remuneration from non-Air Force sources for various off-duty activities.

d. *Introduction to Law*
See N2a.

11. SUCHER, Mark L., Captain and Assistant Professor

a. "Government Procurement Law." (Research)

I conducted research in government procurement law pertaining to notice required to be given to the government by contractors seeking equitable adjustments in contract provisions.

b. "Estate Planning." DFACS, USAF Academy, CO. 29 October 1981; DFAN, USAF Academy, CO. 5 November 1981. (Presentation)
See N13a.

12. VAN NESS, James G., Captain and Assistant Professor

a. "Estate Planning." 4787 ABG, Duluth, MN. May 1981; Alumni College, USAF Academy, CO. June 1981; AFCC, November 1980; DFPS, USAF Academy CO. 3, 10 September 1981; DFC, USAF Academy, CO. 4 September 1981; PACAF, Hawaii, 15-19 September 1981.
See N13a.

b. "Copyright Seminar." Copyright Offices, USAF Academy, CO. 1981. (Presentation)

c. "Estate Planning Devices for the Moderately-Sized Estate." USAF Academy, CO.: DFL. *Copyright Law for Educators*. (Handout)

d. "Personal Estate Planning." USAF Academy, CO.: DFL, 1981. (Videotape)

This videotape was designed for use at remote or small Air Force bases.

13. WILSON, Robert J., Jr., Major and Tenure Associate Professor

a. "Estate Planning." DFPFA, USAF Academy, CO. 18, 20 August 1981; DFF, USAF Academy, CO. 27,29 August 1981; Pentagon, Washington, D.C. 29 August-3 September 1981; DFEM, USAF Academy, CO. 9 October 1981, 22 October 1981; DFCE, USAF Academy, CO. 14 October 1981; DFEGM, USAF Academy, CO. 21-22 October 1981.

This presentation covers avoiding financial pitfalls while accumulating an estate, methods and problems of distributing the Estate. It covers special problems for the military with regard to state laws and emphasizes the role of planning for the future.

b. "Personal Estate Planning."
See N12d.

c. "Temporary Government Employment in Colorado." Distinguished Visiting Professors, USAF Academy, CO 1981. (Presentation)

This presentation covered residence, domicile, taxation and conflict of interest.

d. *Introduction to Law.*
See N2a.

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CHAPTER O
Department of Management

1. BUXTON, John H., Captain and Assistant Professor

a. "Analysis of the Denver New-Issue Stock Market Activity." (Research in progress)

I examine the workings of the volatile new-issue, or so-called "penny" stock market in Denver.

2. EVANCHIK, Michael A., Captain and Instructor

a. "A History of an Air-to-Air Memorandum of Understanding." Hq USAF Office of International Cooperative Research & Development, 1981. (Report)

I prepared a "lessons learned" history of the first memorandum of understanding between NATO allies involving development of two complementary air-to-air missile systems. This was the first step towards formalizing a "family of weapons" concept first proposed by former Under Secretary of Defense, Dr. William Perry. Under this philosophy, NATO allies would develop specific weapons systems, avoid unnecessary duplication, achieve weapons standardization, and save research and development funds.

3. HUSSEY, Robert G., Lieutenant and Research Assistant

a. "Experimental Results of a Combined Core Course in Management Leadership."
See O9a.

4. LEMAK, David J., Captain and Instructor

a. "Time Management."
See O7a.

5. McLAIN, Dennis R., Major and Assistant Professor

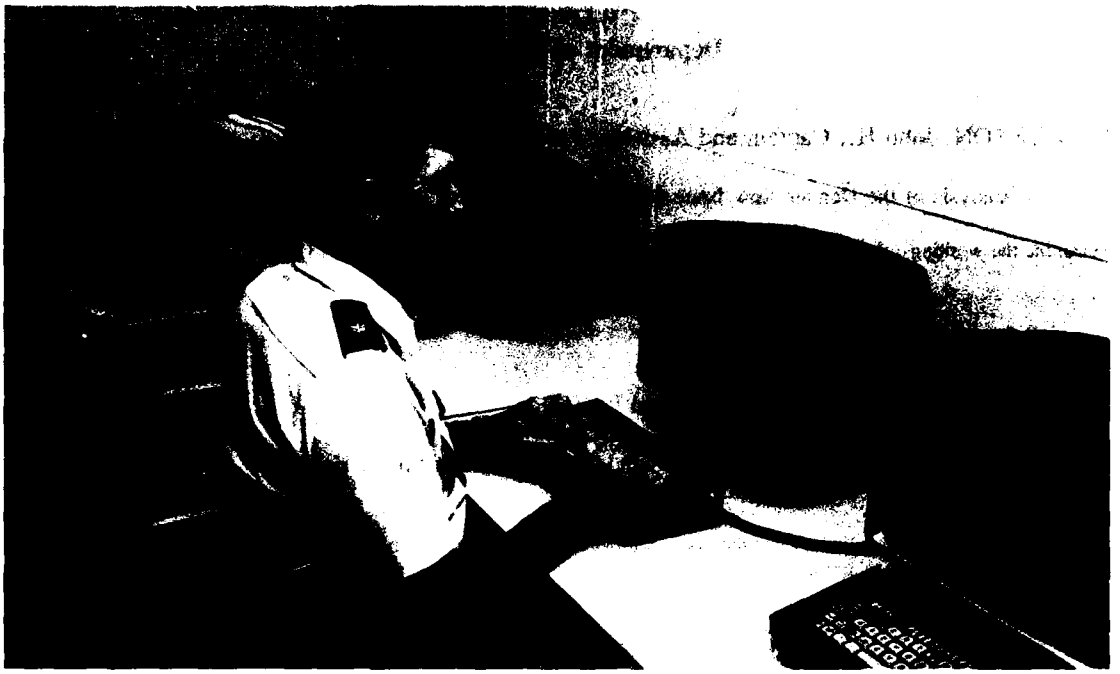
a. "Decentralized Resource Allocation in Hierarchical Organizations." Diss. University of California at Berkeley, CA. 1981. (Dissertation)

I take a resource allocation process involving the distribution of flying training hours from MAC headquarters to MAC wings, and model it as a decomposable linear goal program. The objective is to maximize training outputs among MAC wings subject to resource usage constraints while preserving decentralized decision-making.

6. SAMUELSON, John L., Captain and Instructor

a. "1981 Morale, Welfare and Recreation Customer Survey." MWR Division, USAFA, 1981. (Report)

I developed, conducted, and analyzed the data gathered in this comprehensive survey of USAF Academy MWR customers. The methodology that I established can be used in future years to conduct the survey at a much lower resource cost.



Major Dennis McLain, accesses a decomposable goal programming computer routine he has developed to optimize the scheduling of MAC aeromedical evacuation training.

7. WENGER, Michael S., Captain and Instructor

a. Also with David J. Lemak. "Time Management." Federal Women's Program, USAFA, CO. 2 October 1980. (Presentation)

We conducted two 2-hour sessions on time management to 75 people, including managers, non-managers, civilians, military, men and women, under the auspices of the Federal Women's Program.

8. WOODY, James R., Lieutenant Colonel and Associate Professor and Acting Head

a. "DoD Procurement Policy and Aerospace Financial Risk." Submitted to the *Defense Management Journal*, April 1981. (Article)

In the aerospace industry, economic forces have led to bankruptcies, near bankruptcies and highly publicized government intervention to prevent bankruptcy. Financial failure of a government contractor results in unfulfilled contracts, financial losses, unemployment, erosion of the industrial base and other economic losses. In this article, I highlight the economic importance of the aerospace industry and four economic factors which affect its financial viability: 1) the demand for aerospace products, 2) the advance of aerospace technology and costs, 3) competitive practices within the industry, and 4) the recent economic and financial environment of the industry. I call for a cooperative spirit between government and industry in sharing these risks.

b. "Economics and the Aerospace Industry: A matter of Survival." Submitted to the *Air University Review*, April 1981. (Article)

I identify six DoD procurement policy factors which affect aerospace financial risk, and examine the risk-return balance in the aerospace industry, along with aerospace corporations' motives for competing for DoD contracts.

Captain Mike Vilbert, researches microeconomic theory for clues to effective management strategies in a turbulent economy.

c. "Evaluating Financial Risk Through Financial Analysis." Submitted to the *Financial Executive*, August 1981. (Article)

The financial failure rate rose significantly in the 1970s and the same financial conditions prevail in 1981. Proper evaluation of financial risk is important for the prevention of financial and economic losses that result from corporate bankruptcies. I highlight key past financial analysis research and evaluate current research with a table comparing the results of 9 different bankruptcy prediction models.

d. "Evaluating the Financial Risk of Major Airframe Manufacturers." Submitted to the *Financial Analyst's Journal*, August 1981. (Article)

Are United States airframe manufacturers financially strong enough to fulfill their contracts? Lockheed and Douglas Aircraft Corporations had a close brush with bankruptcy. In this article, I summarize the lessons learned from a financial analysis of Lockheed and Douglas data, illustrate the lessons learned in a financial analysis of five major airframe manufacturers, and make recommendations as to the best methodology for evaluating airframe financial risk.

9. YOOS, Charles J. II, Major and Associate Professor

a. Also with Robert G. Hussey. "Experimental Results of a Combined Core Course in Management and Leadership." USAF Academy Technical Report, forthcoming. (Report)

A full semester experimental core course in management and leadership, which integrated the two respective regular half-semester core courses, was taught during the Spring 1981 semester in three sections, one team and two singles. The regular half-semester core courses were also taught concurrently. We report the analysis of the comparative test data from the experimental and regular courses, in order to determine if combining these topics, and team teaching them, produces a better learning outcome.

b. "The Impact of Executive Succession Events on Complex Organizations." To be submitted to the *Academy of Management Journal*. (Article in progress)

c. "Organizational Aspects of Space: The Implications for National Defense." USAF Academy National Defense Coloquium, USAF Academy, CO. 30 September 1981. (Presentation)

I recapitulated the organizational issues deliberated at the recent Military Space Doctrine Symposium hosted by the USAF Academy, and presented two conceptual models, one normative and one descriptive, for deciding military space organization.

d. "Running in Groups: An Epiphany of Organization." Eighth Annual Organizational Behavior Teaching Conference, Harvard, MA. June 1981. (Presentation)

I investigated the experience of running in groups as an epiphany of organization, a method whereby the essential concept of the phenomenon of social organization is revealed vividly to the student. The robustness of the exercise is emphasized, in terms of its capacity to illustrate a rich variety of key organizational variables and processes. The experiential method was described in a conference session, then enacted with volunteers in a contiguous activity, on 17, 18 and 19 June 1981 at the conference. My talking paper was published in the conference *Proceedings*, Fall 1981.

e. "Soviet Decision-Making as the Outcome of Complex Organizational Processes." USAF Academy Technical Report. (Forthcoming report)

I initiated a research project which is intended to contribute to the understanding of Soviet decision-making as the outcome of complex, dynamic organizational processes, in lieu of the usual, but I believe fallacious, rational actor assumption.

f. "A System Theoretical Paradigm of Organization." (Manuscript in progress)

g. "U.S. Space Organization." USAF Academy Military Space Doctrine Symposium, 1-3 April 1981, USAF Academy, CO. (Report chapter)

I report the deliberations of the space organization panel. The major point of contention was whether or not a Space Command should be created. In a discussion segment, I argue that this is not a salient issue, rather, doctrine must be enunciated, strategies and mission evolved, and then and only then, can an optimum organization form be decided. This chapter is published as part of the Final Report from the USAF Academy Military Space Doctrine Symposium.

CHAPTER P
Department of Mathematical Sciences

1. DONOHUE, Robert F., Jr., Captain and Assistant Professor

a. Also with Steven C. Hoyle. "Analysis of a Test/Retest Strategy." (Research in progress)

This study investigated the effects of a test/retest strategy on proficiency in a core mathematics course. Voluntary retests were permitted after each major test. Cadets were blocked into aptitude groups based on previous academic scores. The final exam score for each cadet was then adjusted for attitude, and used as the measure of proficiency. The adjusted final exam scores were regressed on the basis of three retest variables: average retest gain, number of retests taken, and average retest study time. Both regression and analysis of variance techniques were used to determine whom, if anyone, benefitted from retests.

One result of this study was that low aptitude students studied the most for retests, took the most retests, and yet averaged zero gain on retests. Retests seemed to benefit the higher aptitude students more than any other group.

2. HOYLE, Stephen C., Captain and Instructor

a. "Analysis of a Test/Retest Strategy."
See P1a.

3. JAMES, Robert L., Captain and Instructor

a. "Validation of TAC Disrupter II Simulation."
See P14a.

4. KNEPELL, Peter L., Major and Assistant Professor

a. Also with Robert C. Rue. "DYNA-METRIC — A Repairable Item Inventory System Model." (Research in progress)

DYNA-METRIC is a computer program developed by the RAND Corporation to model a repairable item inventory system. We verified the mathematical development given in RAND Note N-1482-AF for the Air Force Logistics Management Center (AFLMC). We are continuing our work with AFLMC in verifying and improving the model.

5. LITWHILER, Daniel W., Jr., Lieutenant Colonel and Tenure Associate Professor

a. "Operations Research: A Useful Police Management Tool." *Journal of Police Science and Administration.* (Forthcoming article)

I discuss the general applicability of the tools of Operations Research in solving many problems faced by police departments. An example of a successful application by the Oklahoma City Police Department is provided.

b. "Geodetic Metric Location Problems." Paper presented at CORS-TIMS-ORSA Joint National Meeting in Toronto, Canada. May 1981. (Presentation)

I presented preliminary results on the problem of locating faciilities on a sphere (earth). The minimax criterion was chosen so as to solve the bottleneck problem. The use of a geodetic norm is found to be a more proper metric for large region location problems.

c. "Interactive Program for Selecting Cadet Honor Juries." (Research in progress)

6. McCLELLAN, Allen C., Captain and Assistant Professor

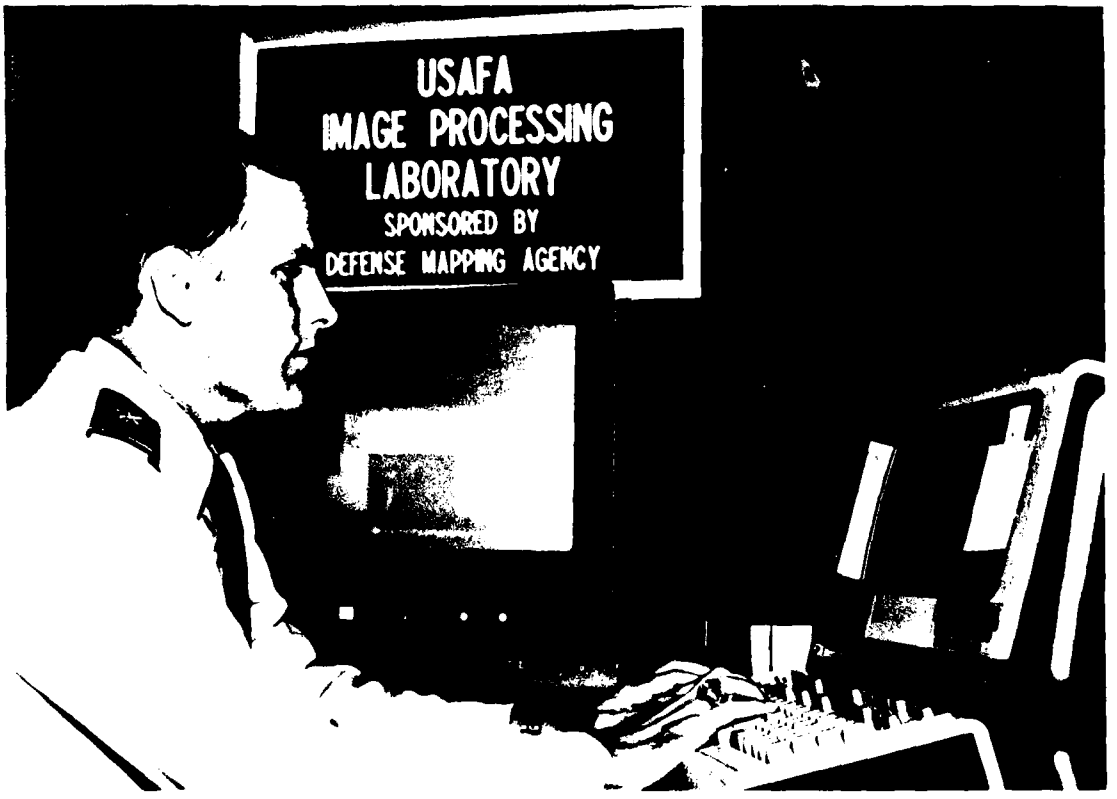
a. "An Automated Algorithm for Mathematics Placement." (Research in progress)

Placement into the proper initial mathematics course for USAFA cadets is a complex process that involves analysis of many factors. ACT and SAT scores, USAFA-computed indices, department-administered exam scores, and reported mathematics background all indicate, to some extent, where a student should be placed. So many factors, often contradictory in their implications, make it difficult for human decision makers on the placement committee to accurately predict performance in "borderline" cases. For a subgroup within the USAFA Class of 1984 a framework was established to evaluate placement accuracy, and an automated computer algorithm was developed (based on discriminant analysis) to place the students. Some surprising comparisons were made between the accuracy of placement by the committee and by the computer. A further refinement of the algorithm is planned for Spring 1982.

7. NELSON, David A., Major and Associate Professor

a. "Image Processing System—Defense Mapping Agency (DMA) USAFA Research and Development Program." (Research in progress)

I have written computer programs which accept digitized stereo pairs of photographs as input. An operator can use the system interactively to construct a mathematical model of any urban scene which appears in the photographs. In the next phase of this research I will display the modeled scene on a graphics terminal thus putting the data in a usable form for DMA map-making.



Major David Nelson, DFMS, conducts research in scene generation using digital imagery on the IIS model 70 image processing system.

8. PACHECO, Nelson S., Major and Tenure Associate Professor

a. "Failure-Free Reliability Tests." (Forthcoming USAFA Technical Report)

A failure-free reliability test is compared with a fixed-time test under a two-parameter Weibull failure distribution. The distribution of the length of the failure-free test is derived, along with conditional failure probabilities for items still operating at the end of the original burn-in time. Graphs are provided for calculating expected test length and conditional failure probabilities.

b. "A Simplified Solar System Design Technique for Tropical Regions." ASME Solar Energy Division's 4th Annual Technical Conference. (Forthcoming presentation)

Research was performed at the Center for Energy and Environmental Research of the University of Puerto Rico. This paper develops simplified statistically based methodology for predicting the percent annual energy load which can be offset by solar energy in tropical climates. Three sets of nomographs are produced, two for water heating systems, and one for a hot air crop-drying system.

9. RAPPOLD, Robert A., Lieutenant Colonel and Tenure Associate Professor

a. "An Investigation of Two Safe Escape from Base Flight Profiles." USAFA Technical Report 81-3. (Report)

This research establishes two base case scenarios for "safe escape" profiles for large conventional aircraft. The profiles considered were: (1) a constant altitude dash, and (2) a constant airspeed climb. The flight profile modeling assumed the aircraft had first reached a safe maneuvering airspeed and altitude. Other assumptions were consistent with aerodynamic and pilot limitations and operational considerations. The governing differential equations of motion are derived and the Runge-Kutta numerical solution technique applied.

b. "An Application of Marginal Return Analysis to Efficient Reorder Point Calculation." USAFA Technical Report 81-2. (Report)

One of the important uses of an EOQ item's probability distribution of demand during leadtime is to establish the reorder point. The current Air Force System computes the reorder point of each item independently. The research presented here shows that a more efficient calculation considers a homogeneous grouping of parts as an entity and bases the reorder point on the individual item's marginal return. In other words, the reorder point for each item is based on the gain in safety stock insurance per dollar invested relative to other items in the homogeneous grouping.

Data from six federal stock groups and three Air Force bases are analyzed. Approximately 3,000 items are involved in the performance comparisons. An examination is made of modifying the marginal return to accommodate the "essentiality" of individual items. Following this effort the reorder point for each item is then coupled with a more nearly optimal order quantity.

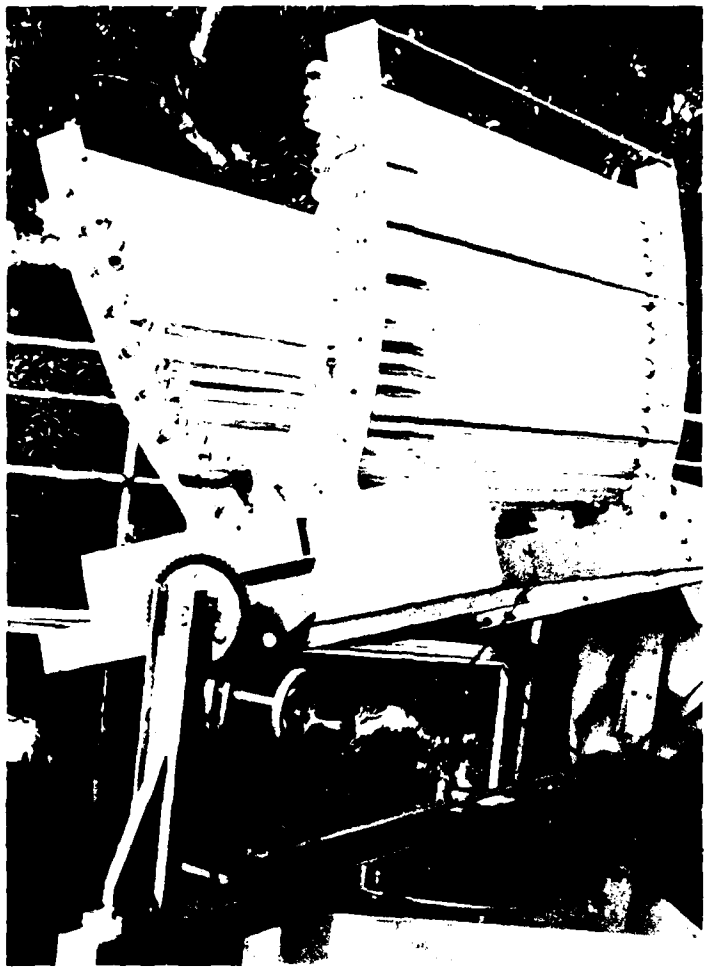
10. RUE, Robert C., Major and Associate Professor

a. "Optimal Control for Entry of Many Classes of Customers to an M/M/1 Queue." *Naval Research Logistics Quarterly 28* (1981), 489-495. (Article)

Dr. Rosenshine of Pennsylvania State University and I develop the solution to the problem of maximizing the gain per unit time of customers who arrive at an M/M/1 queueing system. The customers are from several classes where each class has its own cost per unit time in the system and its own reward for service.

b. "M-14 — A Large Scale Simulation Model."
See P11a.

c. "DYNA-METRIC"
See P4a.



A Solar Design System for tropical regions.

11. SCHOFIELD, Jeffrey E., Lieutenant Colonel and Associate Professor

a. Also with Robert C. Rue. "M-14 — A Large Scale Simulation Model." (Research in progress)

M-14 is a computer simulation model of the Military Airlift Command's (MAC's) strategic airlift system during a 45-day surge for a war. We have assisted MAC by fitting probability distributions to data such as taxi times, crew get-ready times, and time between arrivals of aircraft. We have also helped them decide how many computer runs to make and how long each should be for some of their tests of the model. We traveled to MAC HQ in May to learn more about the model and to meet the people of XPSR who are designing it. We are continuing to work with the people of XPSR to help them develop a good model.

12. SHERMAN, Jay D., Lieutenant Colonel and Tenure Professor

a. "Validation of TAC Disrupter II Simulation."
See P14a.

13. SPATOLA, Michael A., Captain and Instructor

a. "Managing Software in the Weapon System Environment." Aerospace III Conference. (Forthcoming presentation)

The increasing use of computers and software challenges not only software development technology but also software development management. For large systems, distributed processing has become a way of life. For the M-X weapon system, distributed processing is a necessity. It involves numerous computer nodes, architectures, and contractors. Enhancing productivity and performance for M-X, or any weapon system, is measured by successfully developing and delivering the weapon system (and its software). A successful development requires both software technology and software management. While technologies assist in developing computer programs, the development approach can often be pivotal for a successful project. In a weapon system environment, program management by the Government must provide the broad guidance for the actual software development which is usually performed by contractors. For M-X, the management approach includes a discipline to requirements definition, incremental software builds, and comprehensive testing. This approach allows the software to evolve into a mature system.

14. STORER, Richard W., Captain and Instructor

a. Also with Robert L. James and Jay D. Sherman. "Validation of TAC Disrupter II Simulation." (Research in progress)

Work on updating TAC Disrupter has been going on since November 1979 under the program manager, Lieutenant Colonel Harris. In January 1981, the Tactical Fighter Weapons Center (TFWC) asked DFMS for assistance in the validation of TAC Disrupte II, the updated simulation. The modeling technique used for this simulation involves several functional modules each complete within itself, and connected to other modules by use of commons. The entire simulation is still incomplete, but several of the modules are finished and need some validation work.

DFMS has been tasked by TFWC to help validate the attack portion of the offense module. Work in this area will require running some modules on USAFA computers to aid in the validation. Additionally, DFMS will validate the pop-up mathematics used in the simulation, and perform a critical review of all users manuals for the simulation.

Our goal is to provide aid to TFWC and gain an insight into this tactical simulation by using the experience and facilities already available in DFMS.

15. WOOD, Buddy B., Captain and Instructor

a. "Development of the AMRAAM Reliability Program Program." (Research in progress)

The Advanced Medium Range Air-to-Air Missile (AMRAAM) System is being developed as the new beyond visual range armament for the F-14, F-15, F-16 and F/A-18 aircraft. A Joint Service Program with multi-national implications, the AMRAAM Program Office has developed (during the validation phase) a reliability program to implement many of the provisions of DOD 5000.40, MIL-STD-785B and The New Look Initiative. Systematic development of quantitative requirements, independent testing under combined environments, implementation of warranties/incentives, and independent program assessments are the key areas which are discussed in this paper.

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CHAPTER Q
Department of Philosophy and Fine Arts

1. BABSON, Thomas F., Captain and Instructor

a. "A Comparison of 'Basic' and 'Modern' Religions." Catholic High School Sunday School, Fairchild Hall, USAF Academy, CO. 21 September 1981. (Presentation)

In this presentation I attempted to demonstrate that both the "basic" or "primitive" religions and the "advanced" or "modern" religions share many aspects in common. Among them are taboos, notions of what happens after death, and sacred objects and/or places. Differences often stem from respective world views and, interestingly enough, the presupposed world view of "basic" religions often agrees with the notions inherent in the Einsteinian view of the universe. In contrast, the "modern" Western religions often assume a Newtonian universe of absolute space and time.

b. "Duality in Whitehead's Process Philosophy." (Research in progress)

I am currently working on a paper which attempts to show a resolution of the quality inherent in Whitehead's process philosophy. This proposed solution parallels a possible resolution of wave-particle duality in physics, and it points out that this same duality appears in the metaphysical descriptions of Hua-Yen Buddhism.

2. BIGGS, Michael N., Captain and Assistant Professor

a. "On Souls and Divinity in Science: A Question of Method (And a Very Modest Proposal)." Colloquium of the Department of Philosophy and Fine Arts, USAF Academy, CO. 28 April 1981. (Presentation)

The most significant historical movement of the last four hundred years has been the gradual universalization of the scientific method to all aspects of human affairs. Unfortunately, the scientific commitment to *functional order* found in experience as the ground for intelligibility does not leave room to, simultaneously, make sense of the *intentional order* that has traditionally characterized discussions about God and souls—spirits in general. Another method or order is needed to plot the impact of intentions, purposes, and moral freedom in the world.

3. CERVONE, Daniel J., Captain and Instructor

a. "Assessing Leadership and Followership Behavior." BCT Cadre, USAF Academy, CO. 21 May 1981. (Presentation)

I defined eight leadership dimensions showing how they affect one's ability and willingness to lead. I then discussed the differences between mature (active) and immature(passive) followership and pointed out the similarities between effective leadership and followership behaviors. I concluded that the only major differences between an active follower and an effective leader is that the follower possesses leadership qualities but may not be occupying a leadership position at the time.

b. "Sex, Violence, and Morality—or Getting to Know Mozart's *Don Giovanni*." Philosophy and Fine Arts Department Colloquium, USAF Academy, CO. 22 May1981. (Presentation)

Through the use of video-cassette excerpts, I showed how Mozart's opera, *Don Giovanni*, contains, in addition to a profusion of excellent music, enough intrigue, "spice of life," and theatrical devices to overshadow even the most lusty of modern films. Additionally, I pointed out that despite Don Giovanni's ultimate demise, Mozart does not pass moral judgment on this legendary "hero," and, in fact, intimates that the world would be a less interesting place in which to live without people such as the Don.

c. "Music Period Survey—Classical Opera and the Romantic Art Song." Summer Alumni College, USAF Academy, CO. 19 June 1981. (Presentation)

I prefaced the main points of this lecture by, first, exploring musical perspectives; that is, what mental images does the listener have when stimulated by various musical examples, and are these imaginal responses innate or experiential. I then initiated my audience to Classical Opera by incorporating elements of my previous lecture on Mozart's *Don Giovanni*, focusing on the aesthetic rather than the philosophical aspects of the opera. Finally, I revealed the fundamental concepts of the Romantic

movement by comparing and contrasting (through musical examples) the Romantic Art Song with current popular music, highlighting such elements as melody, harmony, rhythm, text, and instrumentation.

4. DAVENPORT, Manuel M., Distinguished Visiting Professor

a. "Annual Meeting of the Mountain Plains Philosophical Association." University of Oklahoma, Norman, OK. 2 - 5 October 1980 (Program Chairman)

b. "Heidegger and the Military Calling." Colloquium of the Department of Philosophy and Fine Arts, USAF Academy, CO. 11 December 1980. (Presentation)

I pointed out that reality, according to Heidegger, reveals those aspects that we select by choosing particular perspectives. Accordingly, there is a perspective uniquely appropriate for the military profession which, if adopted, resolves the usual conflicts between duty and self-interest.

c. "Can Ethics Be Taught?" Joint Services Conference on Professional Ethics, USAF Academy, CO. January 1981. (Presentation)

Whether anything can be taught depends on concepts of teaching and human nature. Whether ethics can be taught depends upon the intended objective. Attempts to impose particular ethical positions or to improve skills in moral reasoning are unethical and nonproductive, but it is proper and possible to present metaethical guides for personal development.

d. "The Problem of Evil." USAF Academy Confraternity of Christian Doctrine, USAF Academy, CO. 8 February 1981. (Presentation)

A lecture on the topic of evil and its relation to religious faith.

e. "Phenomenology, Poetry, and Truth." USAF Academy Department of English, USAF Academy, CO. 11 February 1981 (Presentation)

I showed how phenomenology is quite similar to poetry itself and can be a more effective means to truth than the scientific method.

f. "Ecology as Science and Mysticism." Symposium on Ethics and the Environment, Texas A&M University, College Station, TX. 12 March 1981. (Presentation)

I proposed that scientific ecology seeks cause-effect relations in order to control and as a result overlooks traits of Nature that are not immediately relevant to human needs. Mystical ecology seeks a spiritual unity with Nature but lacks a theoretical framework. A proper ecology should blend the rich content of mysticism with the objective form of science.

5. DIXON, James B., Major and Tenure Associate Professor

a. "Ethical Implications of the Military Profession." (Research in progress)

In these introductory remarks to be published in the forthcoming *American Defense Policy* (5th Edition), USAFA/DFPS, I introduce the reader to some of the moral arguments which attach to the military profession. In particular, I discuss the arguments which (a) assert that there is a connection between morality and the military profession, (b) set out the dilemmas which challenge the integrity of the military professional, and (c) examine the connection between war and morality.

6. FAWKES, Donald A., Captain and Assistant Professor

a. "Comments on Professor Flora Leibowitz's paper 'Ad Hoc Hypotheses and the Development of Modern Physics.'" American Philosophical Association's Pacific Division, Portland, OR. 16-28 March 1981. (Presentation)

My comments did three things: (1) established a further consequence of Leibowitz's paper, (2) raised the question of the motivationin Quantum Mechanics for attempting to generate laws to predict decays which are compatible with present laws but not predicted by present laws (I then suggested three ways of dealing with this question), and (3) criticized a sense of ad hocness which is mentioned by Leibowitz but not discussed by her.

b. "Ad Hoc Hypotheses and Intellectual Progress." Fifth Regional Conference on the History and Philosophy of Science, University of Colorado, Boulder, CO. 8-9 May 1981. (Presentation)

Neither the 'heuristic' sense nor the 'derivability' sense of ad hocness identifies a cognitive liability, but there is an interesting sense of ad hocness, not previously noticed, which does identify such a liability; this I term the ontological sense of ad hocness.

7. KORBA, Rodney J., Captain and Instructor of Art

a. "Pilot Testing of an Original Audiovisual Evaluation Model." (Research)

During periods from 15 January to 1 October 1981, I have been involved with research and testing of an Audiovisual Evaluation Model for the Defense Audiovisual Agency operating location, Norton Air Force Base, California. One of the test subjects for the model has been the remake of the Air Force Academy recruitment film, "Commitment to Excellence." The model itself involves a media selection sub-model, audience need assessment, the design of instructional and persuasive strategies, and the testing of instruction, persuasive and presentation techniques through elaborate storyboard evaluations (pretests) of the audiovisual script. Subsequent post testing assesses the synergistic effects of previously mentioned strategies with the dynamics of the actual audiovisual presentations. I traveled to the Los Angeles area twice (February and July) to conduct storyboard analysis of the film design strategies upon target audiences of potential Academy applications, and briefed a joint Department of Defense/Federal Audiovisual Council committee in Washington, DC (June 1981) on the merits of audiovisual testing and the progress of the pilot study.

8. PARSONS, James H., Major and Associate Professor

a. "The Logic of Concepts: Case Studies in Engineering and Law." Diss. Ohio State University, Columbus, OH. March 1981. (Dissertation)

My review of the histories of certain concepts in engineering and law reveals arguments employed to (1) justify idealizations in conceptual models, (2) choose among competing models, and (3) justify altering background beliefs and examplar sets which support associated models. Using these results I argue for a particular theory of the dynamic processes of conceptual activity. Such a theory contributes to resolving questions of how the transition can be made from exemplars to general concepts and how conceptual evolution can occur as a rational process.

b. "Professionalism and the Military." Air Command and Staff College seminar, USAF Academy, CO. April 1981. (Presentation)

I tried to show why attempts to define or analyze the notion of professionalism by producing a set of necessary and sufficient conditions are failures. I then attempted to demonstrate the importance of exemplars ("war stories," heroes, etc.) in grasping, elaborating, and imparting to others the concept of professionalism in military service.

c. "The Military Profession." Basic Cadet Training, USAF Academy, CO. 1 July 1981. (Presentation)

The stated objectives were (a) to teach the basic cadets what a profession is, how it differs from an occupation, why professions have codes or standards, and how and in what sense the military is a profession, and (b) to establish an understanding of the military profession that will serve as a basis for understanding the function of the Honor Code.

d. "Workshop on Applied and Professional Ethics," sponsored by the Hastings Center at Colorado College. (Participant)

I participated in this workshop, as a representative of the Academy, from 5 July through 11 July 1 981. The purpose of the workshop was (1) to bring together individuals from a variety of different professions and disciplines to examine some major problems of applied and professional ethics, (2) to allow those from the same field to work together in a systematic way on significant moral problems in their field, (3) to assist in the development of a national network of teachers and practitioners concerned to develop their own skills in applied and professional ethics, and (4) to provide ideas and techniques to those concerned with fostering the teaching of applied and professional ethics.

9. STAYTON, *William H., Lieutenant Colonel and Associate Professor*

a. "Judaism, Christianity, Islam: The Common Roots." Divine Redeemer Catholic Church, Colorado Springs, CO. 15 October 1980 (Presentation)

My point was "Islam is not foreign either historically or conceptually to our Judeo-Christian heritage."

b. "Muhammad and Muslim Beliefs." Divine Redeemer Catholic Church, Colorado Springs, CO. 22 October 1980. (Presentation)

On the life and teachings of Muhammad, the founder and prophet of Islam.

c. "Judaism." Humanities class, Air Academy High School, Colorado Springs, CO. 27 October 1980. (Presentation)

I stressed the Jewish history of suffering and how the response to suffering has shaped Judaism today.

d. "Christianity." Humanities class, Air Academy High School, Colorado Springs, CO. 29 October 1980. (Presentation)

I spoke about the Christian religion and tried to portray it as proposing answers to the questions about life which are asked by all people.

e. "Muslim Practices." Devine Redeemer Catholic Church, Colorado Springs, CO. 29 October 1980. (Presentation)

We focused on the "Five Pillars."

f. "The Muslim Community Splits: Different Sects." Divine Redeemer Catholic Church, Colorado Springs, CO. 5 November 1980. (Presentation)

I looked at the primary divisions within Islam today.

g. "The Baha'i Faith." Divine Redeemer Catholic Church, Colorado Springs, CO. 12 November 1980. (Presentation)

I ended a five-session series with a study group by speaking of the history and religious concepts of Baha'i and relating it to Islam.

h. "Basic Indian Religious Concepts." Divine Redeemer Catholic Church, Colorado Springs, CO. 14 January 1981. (Presentation)

I attempted to convey a feeling and understanding of how an Indian views the world. Emphasis was on those ideas that are unlike any we normally have in the West.

i. "Hinduism." Divine Redeemer Catholic Church, Colorado Springs, CO. 21 January 1981. (Presentation)

Diversity was the key word as I considered the bewildering variety of answers Hinduism proposes to man's spiritual needs.

j. "Buddhism." Divine Redeemer Catholic Church, Colorado Springs, CO. 28 January 1981. (Presentation)

I led the group in a look at the life of the Buddha, his basic teachings, and the main d..erences within Buddhism today.

k. "Taoism." Divine Redeemer Catholic Church, Colorado Springs, CO. 4 February 1981. (Presentation)

After considering the teachings of the Indian religions, I led the study group in an analysis of philosophical Taoism. This lecture was a way of introducing them to the typical Chinese understanding of nature and its ways.

l. "Zen Buddhism." Divine Redeemer Catholic Church, Colorado Springs, CO. 11 February 1981. (Presentation)

I was able to show the Taoist influence in Japanese Buddhism and give a taste of the distinctively Japanese approach to religion.

10. WAKIN, Malham M., Colonel and Permanent Professor and Head

a. "Duty, Honor, Country." Fourth Class cadets, West Point, NY. 20 October 1980. (Presentation)

I outlined the role of ethics in the military profession.

b. "The Soldier's Responsibility to Society." Cadet Scholarship Seminar, United States Air Force Academy, CO. 28 October 1980. (Presentation)

c. "An Introduction to Islam." Air Academy High School, Colorado Springs, CO. 20 October 1980. (Presentation)

I reviewed the beginnings of the muslim faith, the life of Mohammed, and fundamental teachings of Islam.

d. "Managerial Integrity." Advanced Personnel Management Course at Maxwell AFB, AL. 16 January 1981, 26 February 1981, 27 July 1981, and 29 September 1981. (Presentation)

The seminar-type lecture reviewed moral issues in American society, the unique nature of moral concerns for military managers, specific cases involving superior-subordinate relationships, the nature of character development, and the fundamental ethical dimensions of the military profession.

e. "Ethics and the Military Profession." Conference of Service Academy Honor Representatives, USAF Academy, CO. 12 February 1981. Army War College, Carlisle Barracks, PA. 11 March 1981. (Presentation)

This presentation dealt with concerns for moral standards in American society and in the unique setting of the military profession. I made comparisons with other distinguished professions, dealt with the harm done by exaggerated zero-defects attitudes (the demand for perfection) and other institutional pressures, examined ways in which moral character is developed and ethical standards fostered in the military environment, and discussed absolutism and relativism in ethics.

f. "The Role of Ethics in the Military Profession." Engineering Division, McClellan AFB, CA. 21 February 1981. (Presentation)

I pursued the thesis that certain moral virtues are functional imperatives in the military profession.

g. "The Concept of Honor in the Middle Ages—Implications for Today." NORAD Dining-In, Peterson AFB, CO. 27 February 1981. (Presentation)

I reviewed the development of the medieval concept of honor from the chivalric codes of the early knights to the Romantic literature of Tennyson and Lovelace. I pursued the influence of this conception on the military code of honor today, emphasizing the differences in views of *what the "gentleman" was and is.*

h. "Ethics and Leadership." AFROTC dining-in, University of Kansas, Lawrence, KS. 10 April 1981; Air War College, Maxwell AFB, AL. 30 April 1981; Air Command and Staff College, Maxwell AFB, AL. 28 September 1981. (Presentation)

I stressed the theme that the line between incompetence and immorality is thinner in the military profession than in almost any other vocation. Support for this thesis comes from an evaluation of the everyday functioning of the military profession, the high cost of human life and national treasure of *military incompetence, and the ultimate purpose of the profession.*

i. "What's Happening at the Air Force Academy?" USAFA Parents Clubs, Philadelphia, PA. 11 April 1981. Pittsburgh, PA. 12 April 1981. (Presentation)

I discussed the current academic curriculum, the new "Stop-Out" program, changes in the administration of the honor system, and the new B.S. with Honors degree.

j. "Moral Elements in the Military Profession." USAF Academy Preparatory School, USAF Academy, CO. 7 May 1981. (Presentation)

I challenged the graduating cadet candidates to understand the nature of the military profession, its role in a free society, and the ethical difficulties it is certain to present as they proceed to positions of leadership.

k. "Ethical Demands of the Military Profession in the Future." *USAF Academy Alumni College*, USAF Academy, CO. 19 June 1981. (Presentation)

I reviewed various conceptions of professionalism, the possible nature of future wars, the changing demands of officership, and civil-military relationships.

l. "Moral Leadership in the Professions." Hastings Center Workshop in Applied and Professional Ethics, Colorado College, Colorado Springs, CO. 5 July - 11 July 1981. (Presentation)

My remarks confronted some of the moral leadership difficulties in the military profession and extended these examples to applications to other professions.

m. "The Role of the Chaplain in Military Ethics." International Conference of National Guard Chaplains, USAF Academy, CO. 23 September 1981. (Presentation)

I examined the ethical issues in military organizations which generate some responsibilities for chaplains in addition to their normal functions as representatives of religious denominations.

n. "Human Rights Versus Utility." *Armed Forces and Society*, Vol. 7, no. 1, (Fall 1981). (Article)

A critical evaluation of Michael Walzer's *Just and Unjust Wars* (New York: Basic Books, 1977), finding much merit in Walzer's overall position but calling into question possible inconsistencies in Walzer's historical examples.

o. "War and Morality." Chapter 16, *Man and Value*, edited by E.F. Kaelin (Florida State University: Florida Universities Press, 1981. (Presentation)

An examination of contemporary versions of just war theory, raising a number of questions about guerilla warfare, counter-insurgency operations, and acts of terrorism.

p. "Ethics of Leadership." Chapter 4, *Military Leadership*, edited by J.H. Buck and L.J. Korb (Beverly Hills, CA: Sage Publications, 1981).

An analysis of two contrasting forms of military leadership characterized as "transactional" and "transformational." In addition, it traces the roots of these forms of leadership to the contrasting views of human nature found in the social contract theories (especially that of Thomas Hobbes) and in the classical Greek position on the polity (Aristotle). It defends the position that professional competence is a moral obligation, most especially in the military profession.

q. *The Teaching of Ethics in the Military Profession*. Hastings Center (forthcoming). (Book)

I am coauthoring this text with Colonel Peter Stromberg of the West Point faculty and Dan Callahan, Director of the Hastings Center. This volume will be the eleventh in the series of monographs published by the Hastings Center and dealing with the teaching of ethics in higher education and in the professions. It examines ethical traditions in the military, recent efforts in the teaching of military ethics, some of the ethical issues confronting the military profession, and the goals in the teaching of military ethics. This volume also provides a discussion of evaluation of ethics teaching in the military, the teaching techniques and problems and recommendations for the future, as well as a substantial annotated listing of useful sources for teachers of military ethics.

11. WENKER, Kenneth H., Lieutenant Colonel and Tenure Professor

a. "Managerial Ethics." Personnel Management for Executives Conference #61, U.S. Army Southwest Regional Training Center, Austin TX. 4 September 1980; Personnel Management for Executives Conference #62, Colorado Springs, CO. 20 January 1981; Management for Hospital Commanders Course, Sheppard AFB, TX. 11 March 1981; Personnel Management for Executives Conference #62, U.S. Army Southwest Regional Training Center, Austin, TX. 22 April 1981; Air Force Professional Personnel Management School, Maxwell AFB, AL. 8 May 1981; Personnel Management for Executives Conference #64, U.S. Army Southwest Regional Training Center, Colorado Springs, CO. 15 July 1981. (Presentation)

b. "Some Comments on 'Just War Theory'." DFPFA Coloquium, USAF Academy, CO. 29 January 1981. (Presentation)

I present a summary of the claims that just War Theorists accept. I emphasize that Just War Theory should not be viewed as a militaristic perspective; rather, it often is used to support varieties of pacifism.

c. "Teaching Leadership Ethics." Third Annual Joint Services Conference on Professional Ethics, USAF Academy CO. 9 January 1981. (Presentation)

I discuss the differences between ethics instruction at the basic training level and ethics instruction at the leadership schools. I find differences (1) in goals, (2) in content, and (3) in methods. (1) At the basic level, we find indoctrination; at the leadership level, education. (2) Basic training emphasizes doing the right thing; the leadership schools should emphasize having the right character. (3) At the basic level, we use reward, punishment, lecture, and emotional appeal; the more advanced uses reason and example.

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CHAPTER R
Department of Physics

1. DOWNS, Robert C., Jr., Captain and Assistant Professor

a. "International NIEMR Standards: Update," *MIIA Weekly Wire*, 1981. (Publication)

I am consulting for the U.S. Army Medical Intelligence and Information Agency (MIIA), Ft Detrick, Frederick, MD. I am analyzing foreign research on the biological effects of nonionizing electromagnetic radiation (NIEMR). This project directly supports Defense Intelligence Agency tasking and USAF requirements. In addition to reviewing literature, I attended the Third Annual Bioelectromagnetics Society meeting in August 1981 and performed two weeks TDY at Ft Detrick in June 1981.

2. EVANS, David, Major and Tenure Associate Professor

a. "Creating a Course on Physics and Literature."
See J17c.

3. GAUDET, John, Captain and Assistant Professor

a. "The Finite Element Method Applied to the System-Generated Electromagnetic Pulse Boundary Layer," May 1981, AFWL-TR-81-12. (Technical study)

This study developed the methodology for employing the finite element numerical technique on the nonlinear boundary layer problem exhibited in System Generated Electromagnetic Pulse.

b. "Learning Physics Assisted by Computer." (Research in progress)

I have developed computer graphics software which allows the student to interactively create a visual color representation of the electric field lines and equipotential surfaces of an arbitrary, discrete charge distribution. The program operates via cursor control, allowing maximum flexibility and creativity for the student.

4. McCANN, Thomas E., Lt Colonel and Tenure Associate Professor

a. "Learning Physics Assisted by a Computer." (Research in progress)

This research is in support of the new physics department effort in mastery learning. I am investigating techniques for presenting problems to students generated by a computer using the unique capabilities of color graphics. Both tutorial and testing modes of student interaction are of interest.

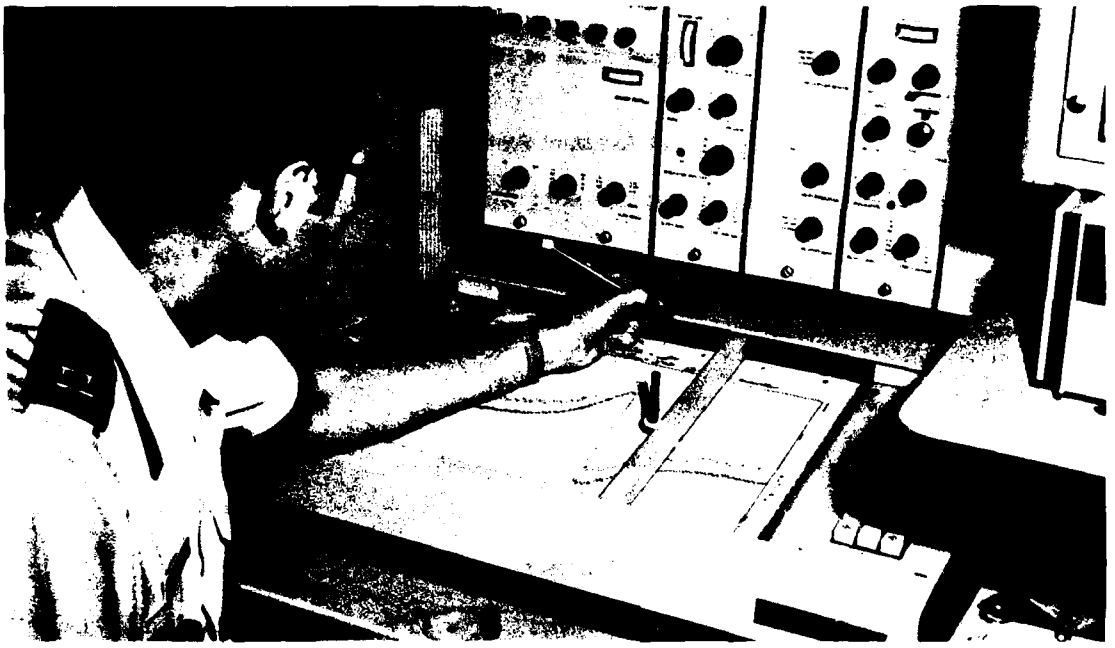
5. PUGH, Henry L. Jr., Captain and Associate Professor

a. "First Steps in the Thermochemical Decomposition of Molten 2,4,6 Trinitrotoluene." 181st American Chemical Society National Meeting. Atlanta, GA. April 1981. (Presentation)

I reported electron paramagnetic resonance (EPR) results and theoretical calculations consistent with these results for thermochemical decomposition of TNT. These results provided us with a better understanding of the first steps in the decomposition of this important explosive.

b. "Thermal Decomposition of RDX Below the Melting Point." Proceedings of the Seventh Symposium (International) on Detonation, June 1981. (Publication)

This paper summarized my recent work with Frank J. Seiler Research Laboratory (FJSRL) on thermochemical decomposition of the important nitramine propellant, RDX. The experimental method for this work was EPR. In this paper, I reported the first evidence that important thermochemical reactions take place in RDX/TNT mixtures at temperatures approaching use conditions.



Captain Henry Pugh studies thermochemical properties of explosives and propellants using Frank J. Seiler Laboratory's electron spin resonance facility

c. "Photochemical Decomposition of TNT and Related Compounds in Ethers." *Journal of Physical Chemistry*, October 1981. (Publication)

In this article, I presented experimental results of FJSRL research on photochemical decomposition of nitroaromatic compounds in ethers. I offered a mechanistic model which explained the experimental results for a wide variety of compounds and solvents.

6. MARTIN, Victor M., Major and Assistant Professor

a. "Quantified Surface Current Detection Through the Use of Computer Enhanced Thermography." Proceedings of the National Radio Science Meeting (URSI), Boulder, CO. January 1981. (Presentation)

This presentation outlined a detailed algorithm that has subsequently been used to eliminate shape dependence in the analysis of complex shapes with thermography.

b. Also with Ronald Sega. "Experimental Determination of Electromagnetic Energy Absorption of Complex Shapes; A Progress Report." Proceedings of the National Radio Science Meeting (URSI), Los Angeles, CA. June 1981. (Presentation)

This presentation covered the progress to date on actually correlating surface temperature increases to existing surface currents.

c. Also with Ronald Sega. "An Infrared Application to the Detection of Induced Surface Currents." Proceedings of the 1981 Society of Photo-Optical Instrumentation Engineers (SPIE) Symposium, August 1981, San Diego, CA. (Presentation)

We discussed the techniques used in interfacing the AGA 680 thermovision with the Hewlett-Packard 9845 minicomputer. Some example digital results were presented. Also, an example of thermographically measured surface currents was presented.

7. SCHROCK, Lee W., Captain and Instructor

a. "Research on Missile Seeker Head Energy Transfer Technology." Interim Draft and Final Report (forthcoming AFAL TR). (Report)

The initial effort was centered on identifying promising energy transfer technologies for future air-to-air missile IR seekers. Techniques patterned after Diptera eyes can provide high resolution, high scanning rates and wide field of view at a fraction of the cost of next generation seekers. A conical nose was constructed and tested to .08° resolution over a 58° field of view.

8. SCHWEIN, Robert G., Jr., Major and Assistant Professor

a. "The USAF Academy Flywheel-Electric Car." Frank J. Seiler Research Laboratory Technical Report. (Publication)

This is the second and final report on the USAF Academy Flywheel-Electronic Car. The car is an operational test vehicle, not a prototype for a commercial car. It weighs 3100 pounds, carries 4 passengers, and cruises at 40 miles-per-hour for about 100 miles before recharging. Technical details are presented that will provide guidance to the reader who wishes to construct a similar vehicle.

b. "Convective Heat Transfer Modeling in Passively Solar Heated Buildings." (Consulting)

This consulting effort supported the solar heating and cooling research being conducted at Los Alamos National Laboratory. Architects and builders must know that the passive solar heating and cooling design will work prior to constructing the building. There is currently no reliable means to predict the heat transfer from room to room in a building designed for passive solar heating and cooling. I designed, constructed, and instrumented an experiment for the purpose of identifying key design parameters or shape factors. With these design parameters architects would be able to vary room ceiling heights, door and window sizes and placement and building orientation. The designer would be able to calculate exactly how many BTU's per unit time would be transferred from room to room. There would be no guessing whether or not the design would function effectively.

Major Vic Martin conducts thermographic measurements at the Air Force Academy in support of RADC's radar cross-section reduction program

c. "Computer Instrumentation in Experiments Designed Using The Calculus of Similarity." Scientific Colloquium, Los Alamos National Laboratory, NM. Q-11 Division. 17 June 1981. (Presentation)

This presentation discussed instrumentation and data collection techniques in experiments that have taken life size buildings and scaled them down using Similarity mathematics. Not only must physical size, shape, and response time of measuring probes be considered but resolution limitations of data acquisition equipment may be intolerable when data is scaled back up to life size buildings.

d. "Instructor Use of Microprocessor Controlled Demonstrations in the Classroom." (Research)

There can be no argument that a "demonstration of a concept" is an invaluable tool the instructor has. But there are points that we bring out in the classroom that would be greatly reinforced with a good demonstration, yet no demonstration exists. The microprocessor is a tool that can be used to develop demonstrations that are needed but were considered impractical. This research explores what is and is not possible when using microprocessors in demonstrations for the classroom. I also seek to identify a system architecture that any instructor can use whether or not that instructor knows anything about microprocessors.

A microprocessor controlled optical spectrometer and transmissometer has been designed and built. This "demonstration" prototype shows how a great deal of information can be clearly and quickly presented that was impractical to do by any other means.

9. SEGA, Ronald M., Captain and Assistant Professor

a. "Experimental Determination of Electromagnetic Energy Absorption of Complex Shapes," Proceedings of the National Radio Science Meeting (USRI), Boulder, CO. January 1981 (Presentation)

This paper outlines a technique for approximating the distribution of induced surface current amplitudes by determining the heating patterns on objects illuminated with electromagnetic energy.

b. "Experimental Determination of Electromagnetic Energy Absorption on Complex Shapes; A Progress Report."
See R6b.

c. "An Infrared Application to the Detection of Induced Surface Currents."
See R6c.

10. SWANSON, Richard, Captain and Assistant Professor

a. "Molecular Dynamics Calculations for Sodium Using Pseudopotential Theory." Los Alamos National Laboratory Report LA-887-T, Los Alamos, NM, June 1981. (Report)

I studied the equations of state of sodium using the molecular dynamic technique whereby the classical motion of a system of ions is solved with the aid of computers. The interaction potential between pairs of atoms is derived from pseudopotential theory which includes the effects of electron gas screening, exchange, and correlation. I calculated equation of state points for solid and liquid sodium and predicted melting and phase change properties which agree well with available data.

b. "A Computer Tutorial for the Spectra and Dynamics of a Diatomic Molecule." (Research in progress)

I developed a tutorial which describes for a student the basic theoretical background necessary to understand the infrared spectra and dynamic motion of a diatomic molecule, using the color graphics capabilities of the TERAK 8600 display system to present the information in an exciting and interesting manner.

CHAPTER S
Department of Political Science

1. ANDREWS, Adolphus, Lieutenant Colonel and Assistant Professor

a. "Urban Development and the Structure of Power." Diss. Ohio State University, Columbus, OH. 1981 (Dissertation)

I examine the local policies associated with urban redevelopment. Research includes extensive interviews with local officials and other citizens of Columbus, Ohio.

2. BERRY, William E., Jr., Major and Assistant Professor

a. "American Military Bases in the Philippines, Base Negotiations, and Philippine-American Relations: Past, Present, and Future." Diss. Cornell University, 1981. (Dissertation)

I present an historical perspective of base negotiations from 1945 to 1980, with particular emphasis on the 1978-1979 agreement and its implementation. He examines alternatives for the United States in the concluding chapters.

b. "Economic, Political, and Social Causes of Indochinese Emigration." Mountain West and Global Interdependence Conference, Denver, CO. 27-29 July 1981. (Presentation)

I examine numerous factors influencing Vietnamese, Cambodian, and Laotian emigration in the post-1975 period.

c. "Armed Forces and National Development." First Wharangdae International Symposium, Seoul, Republic of Korea. 21-22 September 1981. (Presentation)

Major Berry participated in a panel discussion on the role of the military in the modernization process of developing countries.

3. BUCKINGHAM, William A., Jr., Major and Associate Professor

a. *Operation Ranch Hand: The Air Force and Herbicides in Southeast Asia, 1961-1971.* Office of the Air Force History, December 1981. (Book)

I trace the historical decision to use herbicides in the Vietnam War and then examine the role that this usage played in the conduct of the war.

4. BURKE, Joseph E., Captain and Instructor

a. "AWACS's Capabilities and Operational Experiences." (Presentation)

I made 40 presentations to civic groups in the Oklahoma City area describing the capabilities of the AWAC aircraft, its roles, crew training programs, and the history of its deployments.

5. BUTLER, Shannon R., Lieutenant Commander (USN) and Instructor

a. "Soviet Interest, Objectives, and Policy Options in Southwest Asia." Military Policy Symposium of the Strategic Studies Institute, Army War College, PA. September 1981. (Presentation)

I examine the Soviet invasion of Afghanistan and some of the problems and opportunities which have evolved for the Soviet Union.

b. "East German Foreign Policy in theThird World." Naval Postgraduate School, Monterey, CA. May 1981. (Presentation)

I identify how East German and Soviet foreign policies are coordinated, particularly in Africa.

6. COOK, Curtis, Lieutenant Colonel and Tenure Professor and Acting Head

a. "Impact of DoD on Technology," Western Executive Seminar Center, Denver, CO 5 August 1981. (Presentation)

I examined DoD spending and projects in light of national spending and national priorities.

b. "Issues in Defense Policy," Western Executive Seminar Center, Denver, CO. April 1981. (Participant)

I discussed defense issues likely to face the Reagan Administration.

Captain Reichart discusses the world political situation with Major Sturm

7. DELLERMANN, Frank J., Lieutenant Colonel and Associate Professor

a. "The Effect of Political, Economic, and Demographic Change on the International System and U.S. National Security," Air War College, September 1981. (Paper)

I argue that U.S. policy-makers must realize there are political, economic, and demographic changes occurring in the United States that may adversely affect U.S. national security and may be beyond the control of the U.S.

b. "Mutual Balanced Force Reductions." (Research)

I contributed to a paper being prepared by a Senior Inter-Department Group in Washington concerning the future course of negotiations on Mutual Balanced Force Reductions (MBFR). My research was performed during a TDY in Washington during June and July 1981.

8. EWIG, Mark G., Captain and Assistant Professor

a. "The Lessons of Iran and Afghanistan." (Presentation)

I have given presentations to many civic groups in Colorado Springs and Pueblo on the volatile situation in the Middle East.

b. "Intercultural Education for The Indiana ANG."
See L3l.

9. FRENEY, Michael A., Lieutenant Colonel and Associate Professor and Deputy Head

a. *Canadian Constitutional and Energy Questions.* (Research in progress)

I'm analyzing the convergence of constitutional and energy questions in Canada.

b. "Evolution of the Military Profession in Democracies.' Academy Rhodes Scholarship Committee, USAF Academy, CO. October 1980. (Presentation)

I discuss the traditions and modernist arguments.

c. "Evolution of the Curriculum at the National War College." Office of the JCS, Washington, D.C. June 1981. (Presentation)

d. "Process of Change in Senior Service Schools: The Royal Defense College Under Alista Buchan." Office of the JCS, Washington, D.C. June 1981. (Presentation)

e. "Manpower Issues in the 1990s: Alternatives to Conscription." MPC/Y, Randolph AFB, TX. July 1981. (Presentation)

10. FAST, Richard C . Major and Assistant Professor

a. "The Politics of Weapons Standardization in NATO," Diss. University of California at Santa Barbara, CA. 1981. (Dissertation)

I note that domestic political and economic considerations impede efforts to achieve standardization by NATO.

11. HAFFA, Robert P., Lieutenant Colonel and Assistant Professor

a. "Rapid Deployment Strategies for the Half War: Planning U.S. Conventional Forces to Meet a Limited Contingency, 1960-1980." *Diss. Massachusetts Institute of Technology*, Cambridge, MA. (Dissertation research)

I trace, in historical perspective, U.S. conventional force planning for rapid deployment in terms of strategic organization and systems acquisition from 1960 to 1980.

b. Also with Ted Greenwood. "Supply-Side Non-Proliferation." *Foreign Policy*, no. 42, (Spring 1981), 125-140. (Article)

We place emphasis on economic forces or constraints frequently existing in the international nuclear markets which strengthen international non-proliferation regimes and affect the pursuit of U.S. non-proliferation efforts.

12. KLOTZ, Frank G., Captain and Assistant Professor

a. "Western European Attitudes Toward the Current Mutual Balanced Force Reduction Negotiations and the Proposed Conference on Disarmament in Europe." Defense Intelligence Agency, Washington, D.C., July 1981. (Classified research monograph)

Major Berry and Major Young discuss terrorist procedures.

13. KOZAK, David C., Major and Associate Professor

a. Edited with John McCartney. *Readings on Congress and Policy*. Dorsey Press, forthcoming 1981. (Anthology)

This anthology includes documentary and other resources not generally available to students on the U.S. Congress.

14. McCARTNEY, John D., Colonel and Tenure Associate Professor

a. *Readings on Congress and Policy*.
See S13a.

15. MENARCHIK, E. Douglas, Major and Instructor

a. "Crisis Resolution, Decision-Making, and Managing the Entebbe Raid." Diss. George Washington University, Washington, D.C. (Dissertation research)

I examine the decision-making structure that was involved in executing the Entebbe raid.

b. "Terrorism." Indiana National Guard. October 1980; Monument CO. Lions Club. August 1981. (Presentation)

I have presented topics of terrorism to include the personalities involved, the methods used, and the international impact.

c. "Intercultural Education for The Indiana ANG."
See L3l.

16. MURRAY, Douglas J., Lieutenant Colonel and Associate Professor.

a. *The Defense of Nations: A Comparative Approach.*
See S22a.

17. REICHART, John F., Captain and Associate Professor

a. Edited with Steven R. Sturm. *American Defense Policy*, Johns Hopkins University Press. (Forthcoming Anthology)

This is the 5th edition, of an edited anthology.

18. SORENSON, Marius G., Captain and Instructor

a. "China and the U.S. National Security." Intelligence School, Lowry AFB, CO. September 1981. (Presentation)

I addressed the students on the developing relationship between the U.S. and People's Republic of China and the implications for future security considerations.

19. STEWART, Clay A., Captain and Instructor

a. "Intercultural Education for the Indiana ANG."
See L31.

20. STURM, Steven R., Major and Instructor

a. *American Defense Policy.*
See S17a.

21. SULLIVAN, Ronald J., Major and Assistant Professor

a. "Strategic Force Survivability: An Intellectual History." Diss. The Fletcher School of International Law and Diplomacy." (Dissertation research)

I examine the historical development of the concept of strategic survivability from the end of World War II to 1958, including the basic assumptions and their origins prior to the Gaither Report.

22. VIOTTI, Paul R., Major and Tenure Associate Professor

a. Edited with Douglas J. Murray. *The Defense of Nations: A Comparative Approach.* Johns Hopkins University Press, (forthcoming). (Book)

This book uses a common framework designed by the editors for the comparative study of defense policy, to include the international environment, national objectives, strategy, and military force employment doctrine. Countries examined are the United States, the Soviet Union, China, France, Great Britain, Japan, Romania, Sweden, and Israel.

23. WALLER, Forrest E., Captain and Instructor

a. "Soviet-U.S. Military Balance." USAFA NCO Academy, CO. June 1981. (Presentation)

I compared Soviet and American strategic and conventional forces, as well as alternatives for U.S. defense policy.

b. "Presidential Control of Centralized Intelligence." (Forthcoming article)

This is an inquiry into the nature of presidential control over the national intelligence community.

24. KENT E. WOLCOTT, Major and Assistant Professor

a. "The Political Regime of Outer Space." Diss. Washington University, Seattle, WA. (Dissertation research)

I attempt to determine who the political actors are in the political regime of outer space. Both state and non-state actors are identified, as well as how they relate to each other and the outputs of their interactions, whether in treaties or other cooperative agreements.

25. YOUNG, Robert M., Major (USA) and Instructor

a. "Syria After Assad." Defense Intelligence Agency, July 1981. (Intelligence Memorandum)

b. "The Soviet Soldier." CWIT, USAF Academy, CO. September 1981. (Presentation)

This was based on my experiences of working for a Soviet officer while serving with the U.N. Peace-Keeping force in the Sinai.

c. "The Invasion of Lebanon." Cadet Audience, USAF Academy, CO. 1981. (Presentation)

This provides insights to the Israeli invasion of Lebanon in 1978.

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